CA9806 4 Channel 1 ~ 15 Gb/s Bit Error Rate Tester

User Manual

(V1.00) **(draft)**

Nov., 2014

UC INSTRUMENTS CORP.

Notices

Subject Matter

The material in this document is subject to change without notice.

UC Instruments Corp. makes no warranty of any kind with regard to this printed material, including, but not limited to, the implied warranties of merchantability and fitness for a particular purpose.

UC Instruments Corp. shall not be liable for errors contained herein or for incidental or consequential damages in connection with the furnishing, performance, or use of this material.

Warranty

This UC Instruments Corp. product is warranted against defects in material and workmanship for a period of 12 months from date of shipment. During the warranty period, UC INSTRUMENTS CORP. will, at its option, either repair or replace products that prove to be defective.

For warranty service or repair, this product must be returned to a service facility designated by UC Instruments Corp. Buyer shall prepay shipping charges to UC Instruments Corp. and UC Instruments Corp. shall pay shipping charges to return the product to Buyer. However, Buyer shall pay all shipping charges, duties, and taxes for products returned to UC Instruments Corp. from another country.

UC Instruments Corp. warrants that its software and firmware designated by UC Instruments Corp. for use with an instrument will execute its programming instructions when properly installed on that instrument. UC Instruments Corp. does not warrant that the operation of the instrument, software, or firmware will be uninterrupted or error free.

Limitation of Warranty

The foregoing warranty shall not apply to defects resulting from improper or inadequate maintenance by Buyer, Buyer-supplied software or interfacing, unauthorized modification or misuse, operation outside of the environmental specifications for the product, or improper site preparation or maintenance.

No other warranty is expressed or implied. UC Instruments Corp. specifically disclaims the implied warranties of Merchantability and Fitness for a Particular Purpose.

Exclusive Remedies

The remedies provided herein are Buyer's sole and exclusive remedies.

UC Instruments Corp. shall not be liable for any direct, indirect, special, incidental, or consequential damages whether based on contract, tort, or any other legal theory.

Assistance

Product maintenance agreements and other customer assistance agreements are available for UC Instruments Corp. products. For any assistance contact the UC Instruments Corp. Maintenance Service Center.

Storage and Shipment

The instrument can be stored or shipped at temperatures between -30℃ and +80℃. The instrument should be protected from temperature extremes that may cause condensation within it.

Safety Considerations

WARNING: The instrument is not designed for outdoor use. To prevent potential fire or shock hazard, do not expose the instrument to rain or other excessive moisture.

The following general safety precautions must be observed during all phases of operation, service, and repair of this instrument. Failure to comply with these precautions or with specific warnings elsewhere in this manual violates safety standards of design, manufacture, and intended use of the instrument. UC Instruments Corp. assumes no liability for the customer's failure to comply with these requirements.

Before operation, you should review the instrument and manual for safety markings and instructions. You must follow these to ensure safe operation and to maintain the instrument in safe condition.

WARNING: To avoid hazardous electrical shock, do not perform electrical tests when there are signs of shipping damage to any portion of the outer enclosure (covers, panels, and so on).

Line Power Connection

WARNING: To avoid the possibility of injury or death, you must observe the following precautions before switching on the instrument.

- Do not remove protective covers. Operating personnel must not remove instrument covers. Component replacement and internal adjustments must be made only by qualified service personnel.
- Instruments that appear damaged or defective should be made inoperative and secured against unintended operation until they can be repaired by qualified service personnel.
- Defective, damaged, or malfunctioning laser sources must be returned to UC Instruments Corp. Maintenance Service Center.
- Do not operate the instrument in the presence of flammable gases or fumes. Operation of any electrical instrument in such an environment constitutes a definite safety hazard.

Table of Contents

CA9806 4 CH 1 ~ 15 Gb/s Bit Error Rate Tester Mainframe

The UC INSTRUEMNTS CA9806 is a high performance, easy to use, all-in-one, costeffective, 4 CH 1 ~ 15 Gb/s Bit Error-Rate Tester(BERT) for current 40 G TOSA/ROSA components R&D and manufacturing environments as well as field installations. The CA9806 incorporates an internal reference clock, a pattern generator, clock recovery circuits, and a BER analyzer, in one compact module that provides both electrical and optical interfaces at data rates up to 17 Gb/s per channel. The CA9806 is offered with an USB interface.

The PPRBS outputs optical NRZ waveform with bit rate within 1 ~ 17 Gbps, with settable data pattern of 2^7-1, 2^9-1, 2^{11}-1, 2^{15}-1, 2^{23}-1, 2^{31}-1, 2^{58}-1, and fixed 8, 16, 32, 64-bit user-defined pattern. The BERT system is controlled by external computer via a USB port, with full software support, drivers and programming guide for automation.

Figure 1 CA9806 Mainframe

Features

- Bit rates from 1 ~ 17 Gb/s; 4 Channels
- PRBS 2^7-1, 2^9-1, 2^{11}-1, 2^{15}-1, 2^{23}-1, 2^{31}-1; 2^{58}-1; user defined pattern , and 8, 16, 32, 64bit definable
- Pre-emphasis output signal functionality
- 4 CH PPG and 4 CH Error Detector were integrated in one compact mainframe
- Computer control via USB
- Cost effective solution for production

Applications

- Testing of optical transceiver modules (**CFP2, CFP4, QSFP28 ,** SFP+, XFP, X2, Xenpak, XPAK), transponders, linecards, and subsystems
- Testing of opto-electronic components and devices (TOSA, ROSA, lasers, etc…)
- Testing of Gb/s ICs, PCBs, electronic modules, subsystems, and systems
- Serial bus and high-speed backplane design
- Installation testing and troubleshooting in optical transport networks

Specification

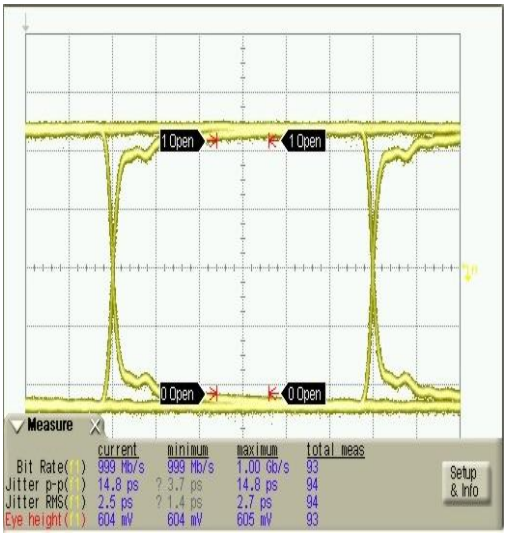
Absolute Maximum Ratings	Symbol	Min.	Typ.	Max.	Unit	Notes
Storage Temperature	Ts	-20	–	70	°C	
AC Voltage Range	VAC	90	–	246	VAC	
AC Voltage Frequency Range	VFREQ	47	–	63	Hz	
Data RF and Clock Voltage Output	VOUT	-0.5	–	1.4	V	
Data RF Voltage Input	VinData	-0.5	–	1.8	V	
Clock In Voltage Input	VinClk	0	–	1.2	V	
USB Pin Voltage	VinUSB	-0.3	–	5.5	V	
RF and Clock ESD HBM	RFesdH	-1000	–	1000	V	
RF and Clock ESD CDM	RFesdC	-250	–	250	V	
RF, Clock and USB Latchup	VI	-100	–	100	mA	
USB ESD HBM	USBesdH	-2000	–	2000	V	
USB ESD CDM	USBesdC	-500	–	500	V	
Electrical Characteristics	**Symbol**	**Min.**	**Typ.**	**Max.**	**Unit**	**Notes**
Case Temperature	Tc	5	–	45	°C	
AC Supply Current	Icc	0.75	100	–	mA	
Baud Rate (NRZ format)	BR	1	15	–	Gb/s	(Note 1)
Baud Rate Setpoint Accuracy	BRa	-10	–	+10	PPM	(Note 2)
Baud Rate PPM Offset	BRo	-999	–	999	PPM	1 PPM step size
Power On Initialization Time	Ton	–	–	15	Seconds	
Eye Phase Steps	EMp	–	–	64	Steps	2 pS per unit
Eye Amplitude Steps	EMv	–	–	128	Steps	7.8 mV per unit
Fixed Pattern Length	PL	–	–	64	Bits	
Note 1: Contact Factory for higher and lower operation						
Note 2: Aging, Temperature and Voltage						

TX Electrical	Symbol	Min.	Typ.	Max.	Unit	Notes
CML Output (Single Ended)	VoutSE	0	–	750	mVpp	AC Coupled
CML Output (Differential)	VoutDIFF	0	–	1500	mVpp	AC Coupled
CML Output (Differential) Step Size	VoutSS	–	25	–	mVpp	
CML Output (Differential) Squelch	VoutSqu	0	–	30	mVpp	
CML Output (Rise/Fall Time)	tR, tF	20	–	–	ps	20-80%
Output Impedance (differential)	Zout	–	100	–	Ω	
Termination Mismatch	TZm	–	–	5	%	At 1 MHz
AC common mode voltage	TACcm	–	–	15	mVRMS	
Differential Return Loss	SDD22	-8	–	–	dB	.01 to 10 GHz
		(Note 3)	–	–	dB	10 to 15 GHz
Common Mode Return Loss	SCD22	-6	–	–	dB	.1 to 10 GHz
		(Note 4)	–	–	dB	10 to 15 GHz

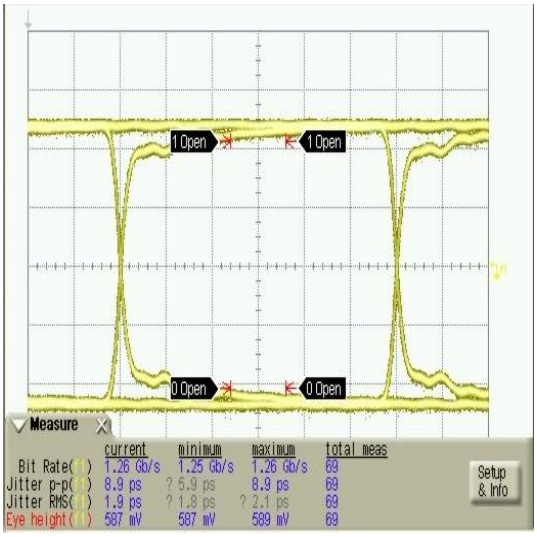
Transmitter Qsq	Tqsq	50	–	–	–	
Jitter (RMS)	TJrms	–	–	1.5	ps	(Note 5)
Jitter (PK-PK)	TJpp	–	–	8	ps	(Note 5)
Pre-Emphasis Control	TPE	–	17	–	dB	at 500 mVPPDIFF
De-Emphasis Control	TDE	–	17	–	dB	at 500 mVPPDIFF
Note 3: -8 dB + 16.6 dB/dec*log10(f/10 GHz)						
Note 4: -6 dB + 16.6 dB/dec*log10(f/10 GHz)						
Note 5: Agilent DCA-X with 50 GHz plug-in, 23-1 PRBS pattern and 500 waveforms using a precision time base trigger						
RX Electrical	Symbol	Min.	Typ.	Max.	Unit	Notes
Baud Rate Tolerance	BRt	-100	–	+100	PPM	
CML Input Voltage (Single Ended)	VinSE	100	–	800	mVpp	AC Coupled
CML Input Voltage (Differential)	VinDIFF	100	–	1600	mVpp	AC Coupled
Input Impedance (Differential)	Zin	–	100	–	Ω	
Termination Mismatch	RZm	–	–	5	%	At 1 MHz
AC common mode voltage	RACcm	–	–	25	mVRMS	
Differential Return Loss	SDD11	-12	–	–	dB	.01 to 2 GHz
		-8	–	–	dB	2 to 10 GHz
		(Note 3)	–	–	dB	10 to 15 GHz
Common Mode Return Loss	SCD11	-6	–	–	dB	.1 to 10 GHz
		(Note 4)	–	–	dB	10 to 15 GHz
CDR Acquisition Lock Time		–	–	300	mS	

Clock - Input	Symbol	Min.	Typ.	Max.	Unit	Notes
Frequency	CFin	156,248,438	156,250,000	156,251,562	Hz	Square wave
Single Ended Voltage Swing	CVpp	0.4	–	1.2	V	
Input Impedance	CRin	49.5	50	50.5	Ohm	AC coupled
Rise/Fall Time	CitR, CitF	–	–	1	nS	20%-80%
Duty Cycle	CDC	40	–	60	%	<1nS Tr/Tf
Random Jitter (RMS)	CRj	–	–	1	ps	12 kHz–20 MHz
Clock - Output	Symbol	Min.	Typ.	Max.	Unit	Notes
Programmable Divider of Line Rate	CPDLR	2	–	64	/N	Factors of 2
Single Ended Voltage Swing	CVoutSE	0	–	800	mVp	AC coupled
Squelch Voltage Output	CVsquelch	–	–	30	mVp	
Termination Mismatch	CZm	0	–	5	%	At 1 MHz
Rise/Fall Time	COtR, COtF	20	–	–	ps	20-80%
Ouptut Return Loss	CS22	-8	–	–	dB	
Jitter (RMS)	CJrms	–	–	750	fs	(Note 5)
Jitter (PK-PK)	CJpp	–	–	3.5	ps	(Note 5)
Note 5: Using Agilent DCA-X with 50 GHz plug-in. 500 waveforms using a precision time base trigger						
Note 6: Terminate clock output if not used						

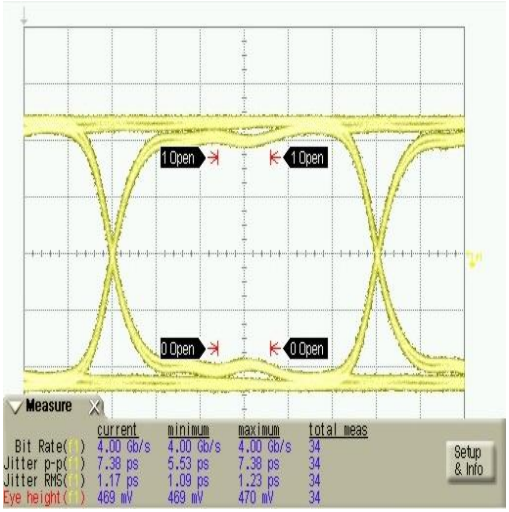
Typical Electronics Eye Diagram



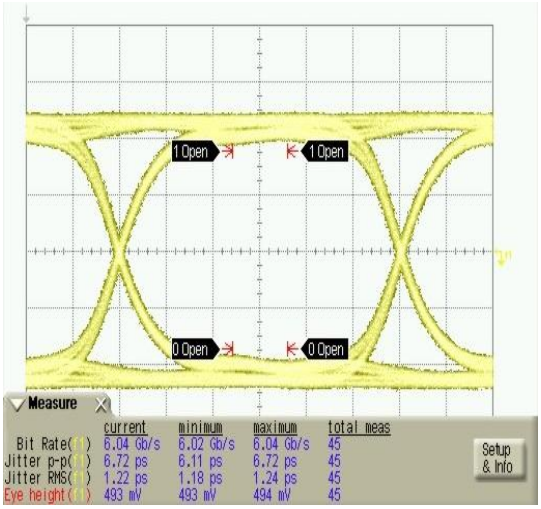
1.0 Gb/s



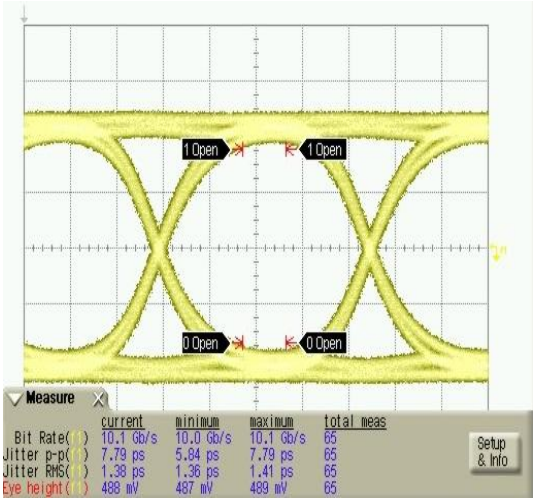
1.25 Gb/s



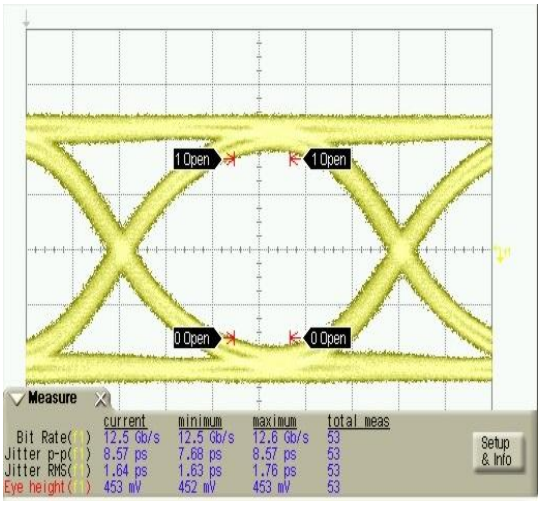
4.0Gb/s



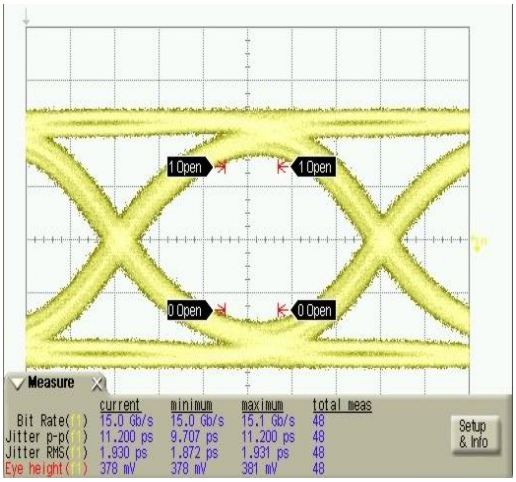
6.0 Gb/s



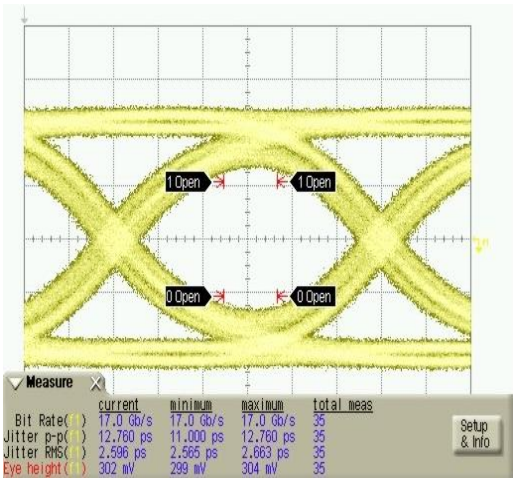
10.0Gb/s



12.5 Gb/s



15.0 Gb/s



17.0 Gb/s

Buld-in Eye Diagram Testing Function

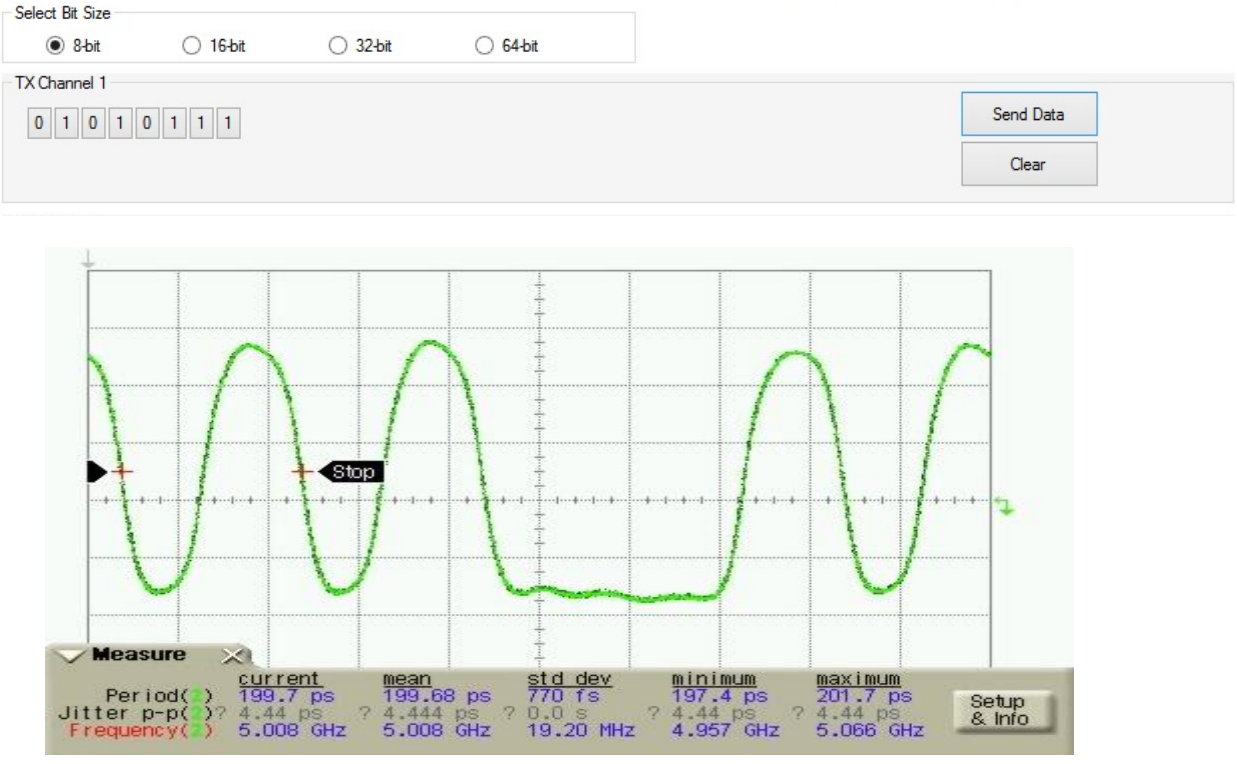
8.5 Gb/s Eye Diagram

10.0 Gb/s Eye Diagram

15.0 Gb/s Eye Diagram

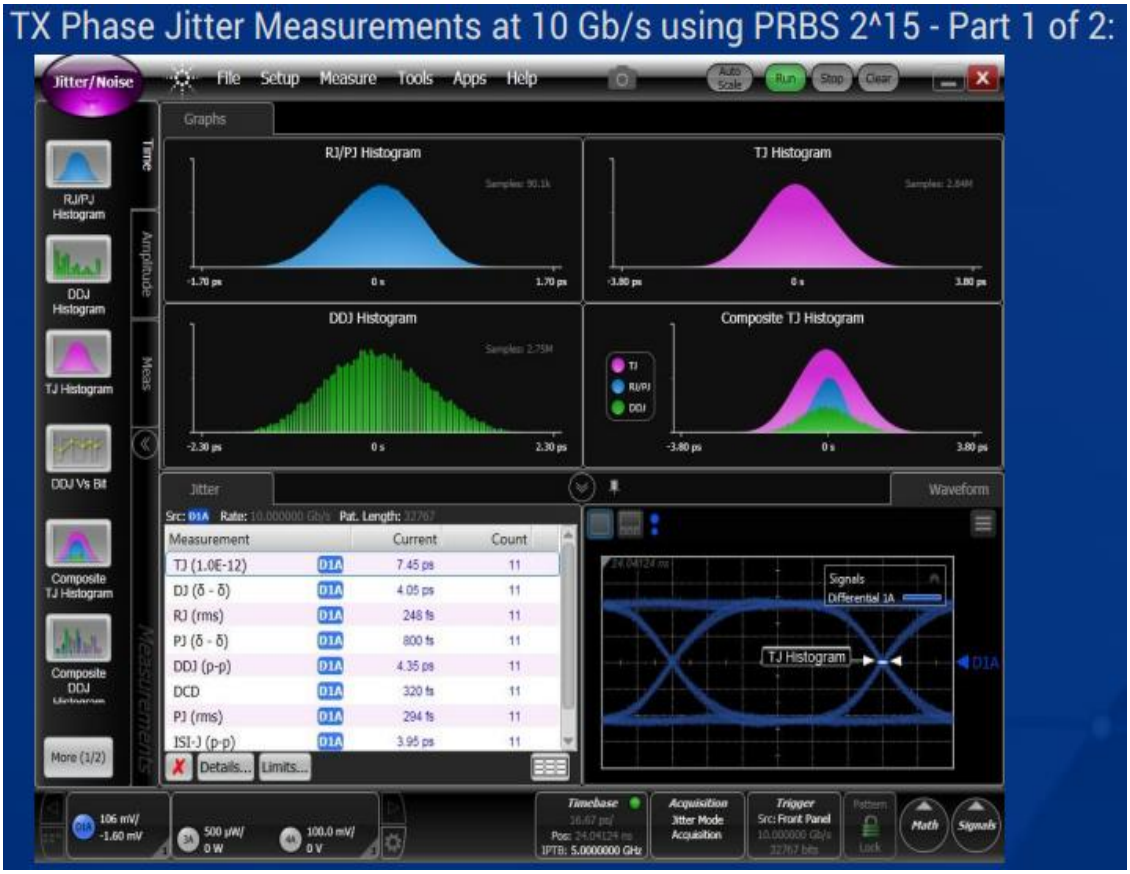
TX Fix Pattern Output

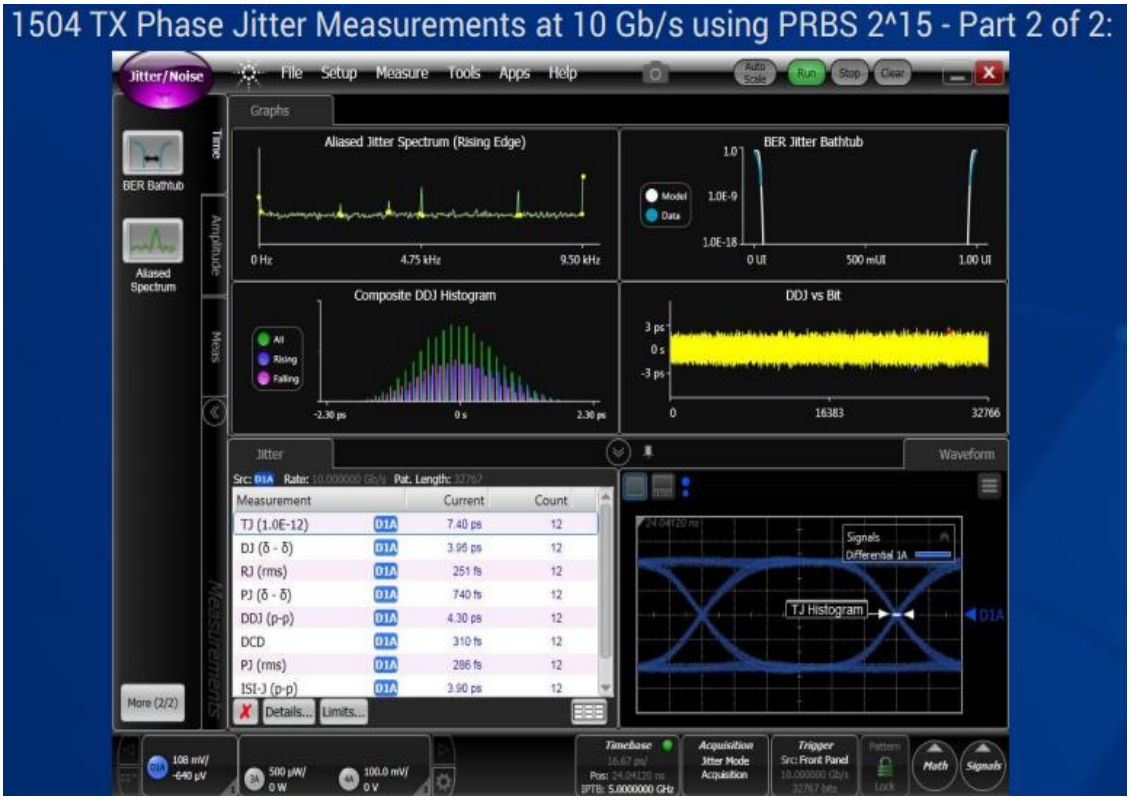
10 Gb/s Fixed TX Pattern 8-Bit 01010101 Pattern output



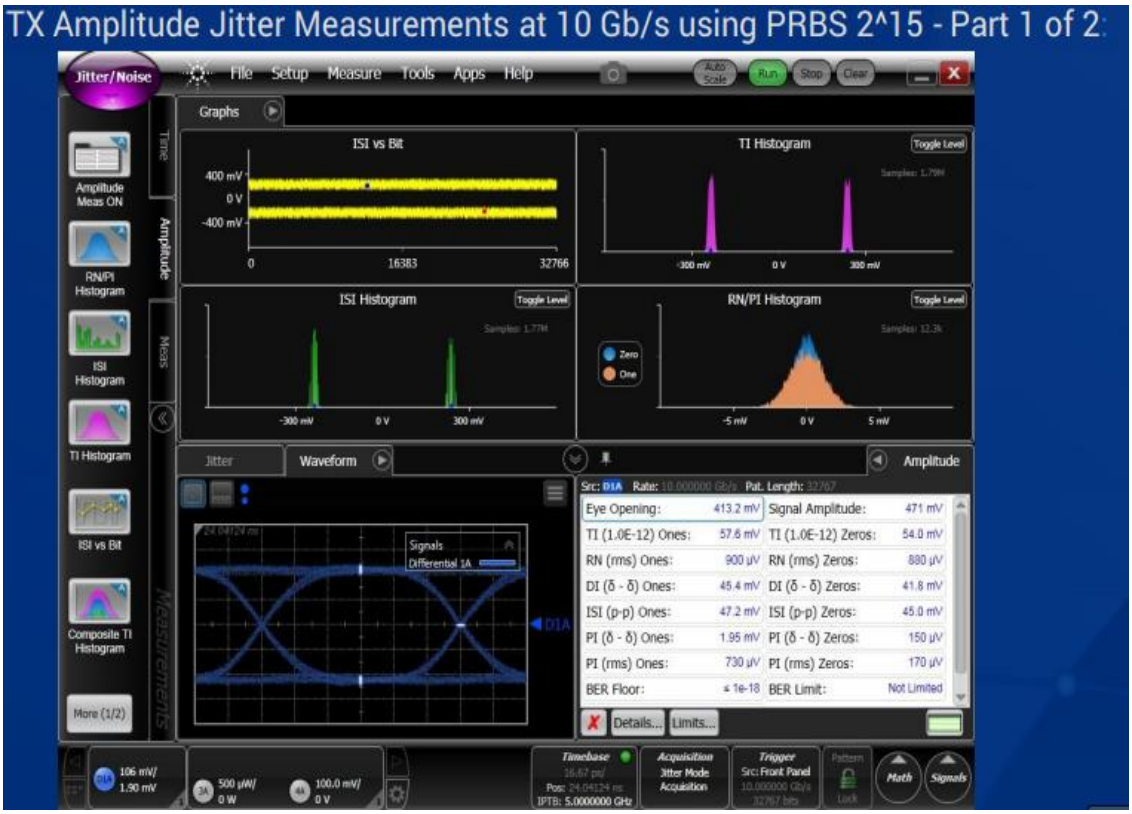
10 Gb/s Fixed TX Pattern 8-Bit 01010111 Pattern output

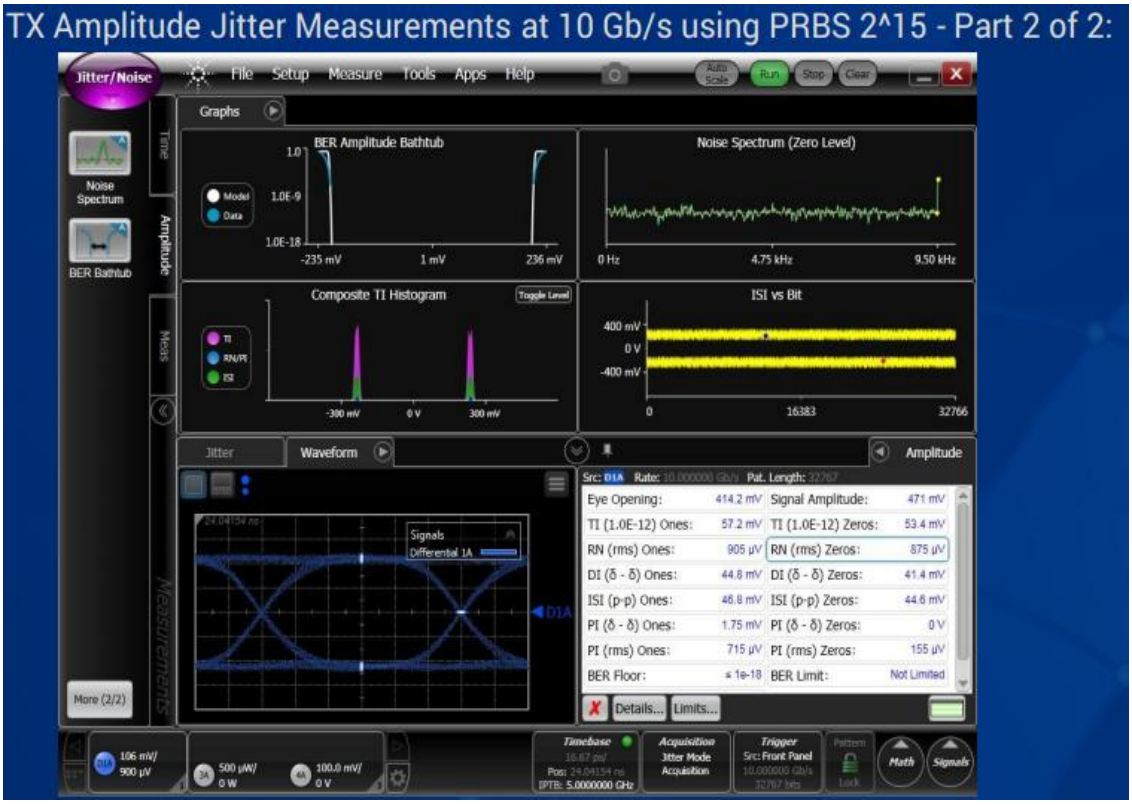
Jitter Phase Measurement



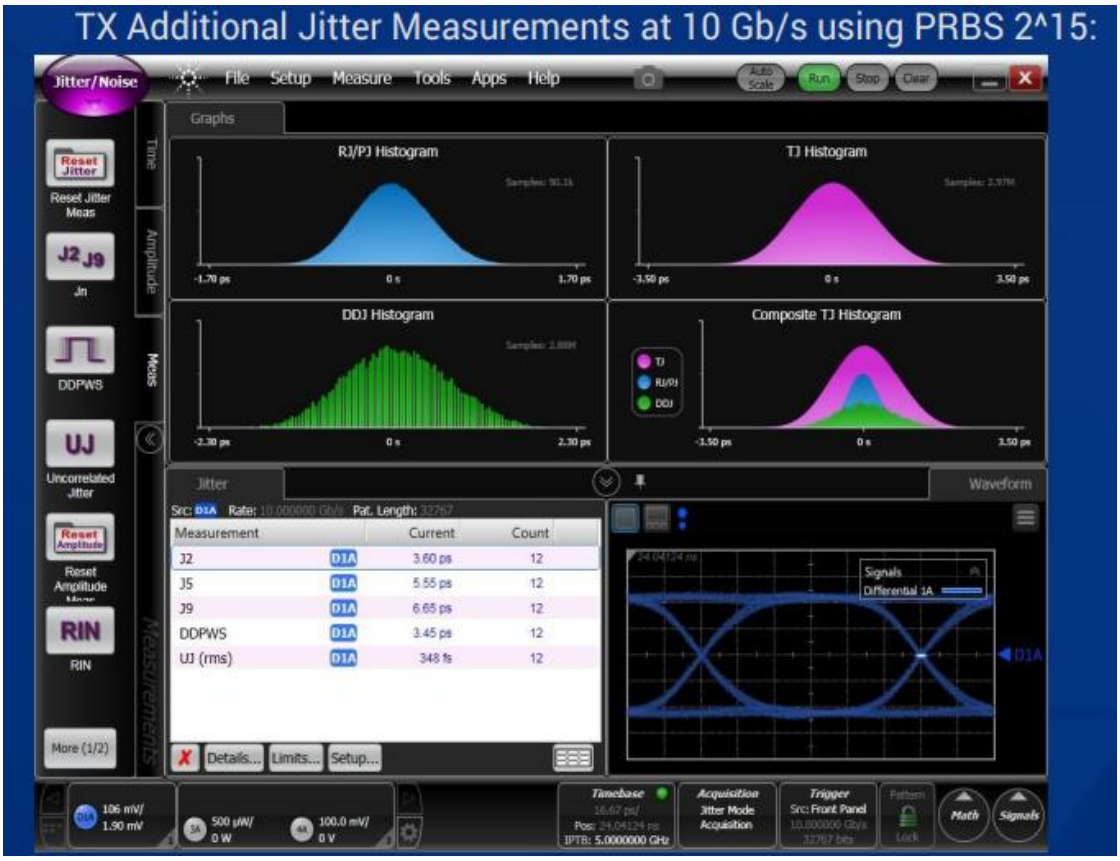


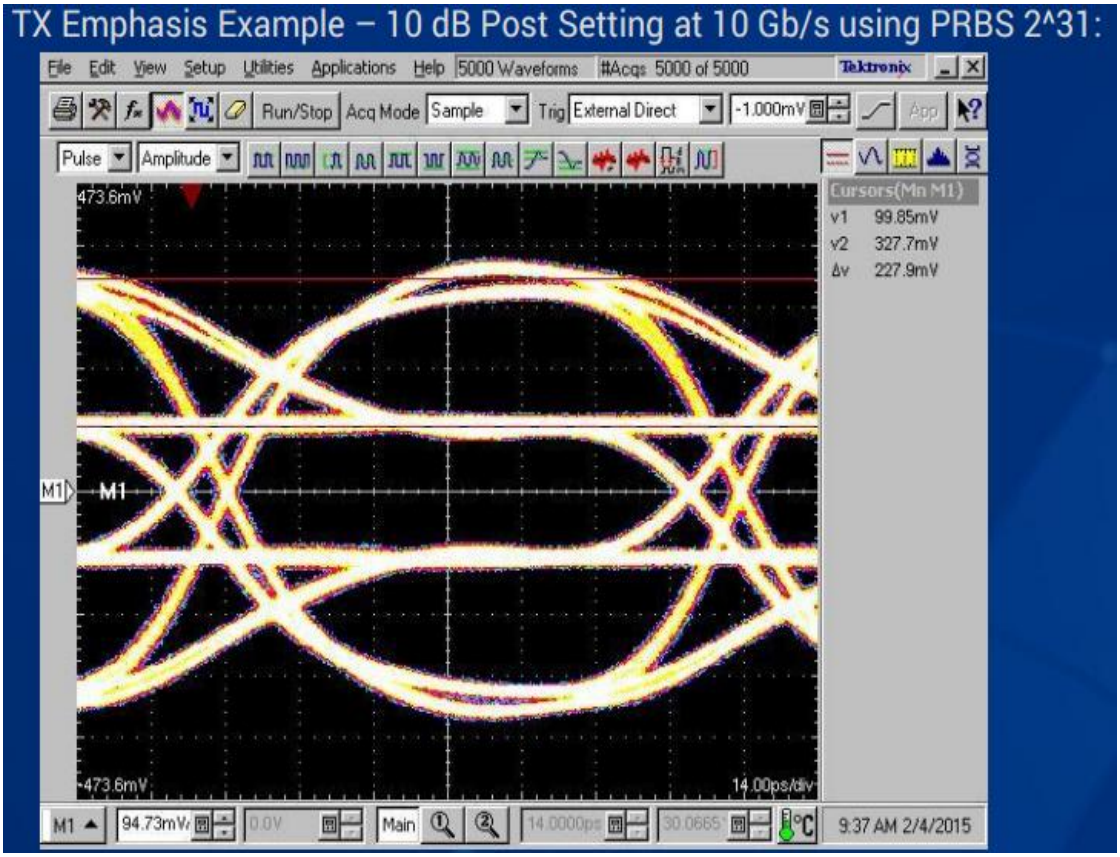
Amplitude Jitter Measurement;





Additional Jitter and Emphasis Example





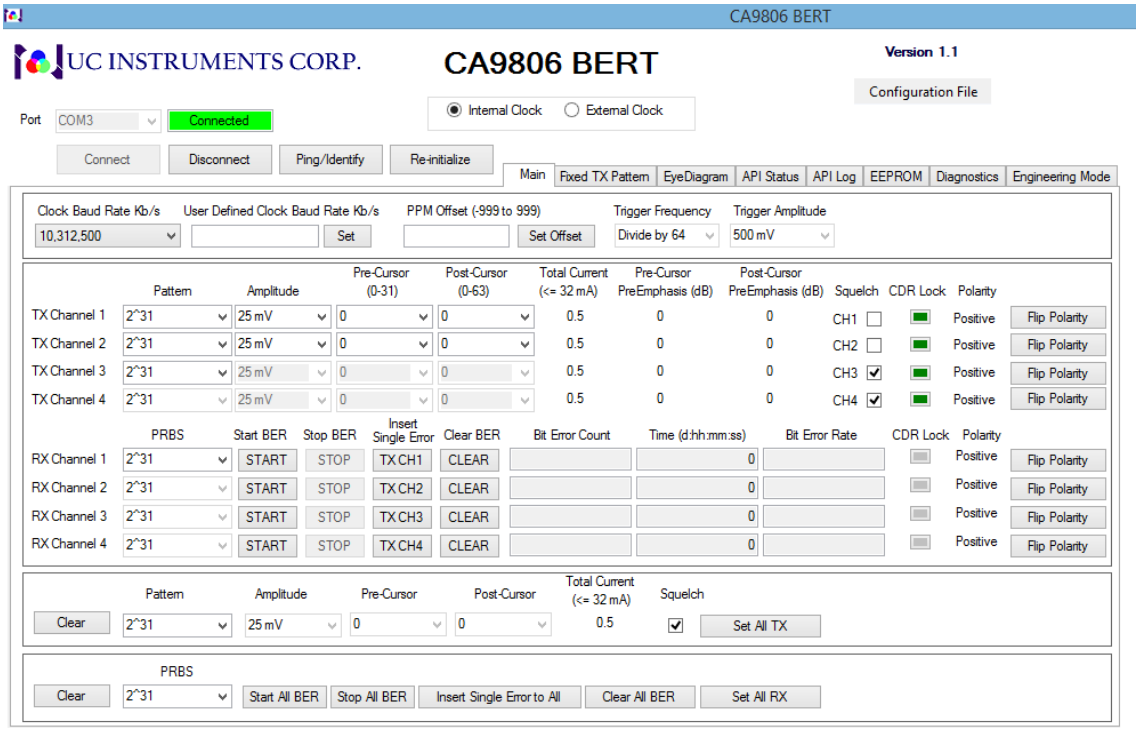
Hardware connection:

1. Link CA9806 with computer by USB cable.

2. Connect AC-DC power adaptor with CA9806 module and wall power.

3. If you have Agilent 86100C and 83483A ready to test CA9806 SMA cable connection as below:

Software Interface

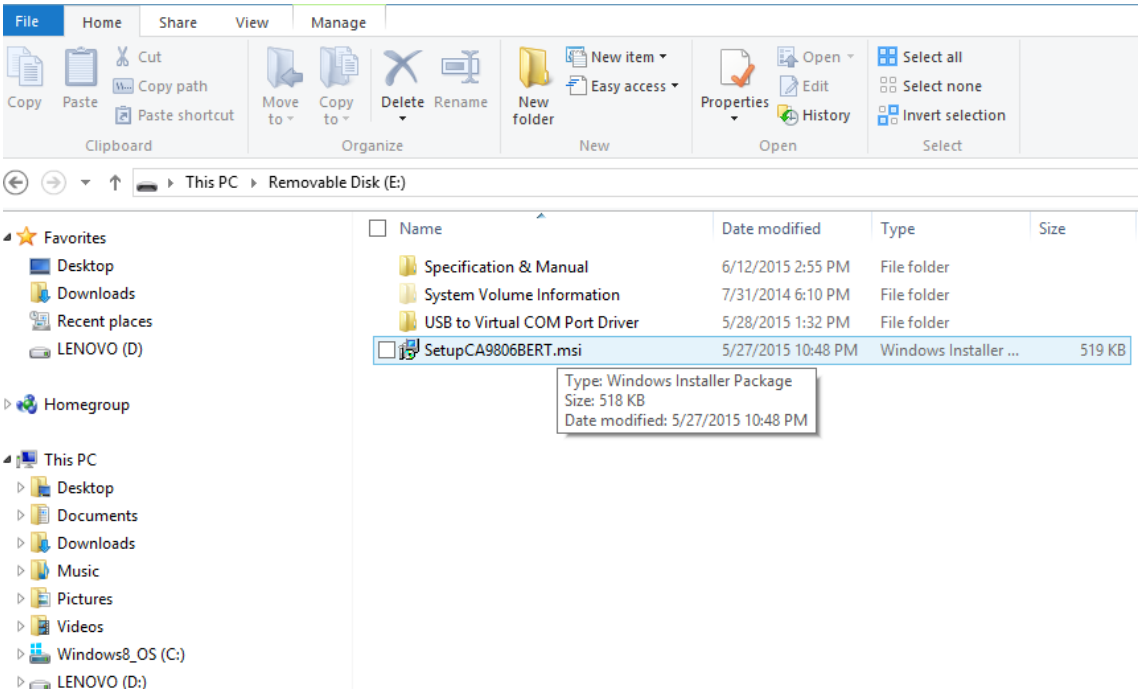


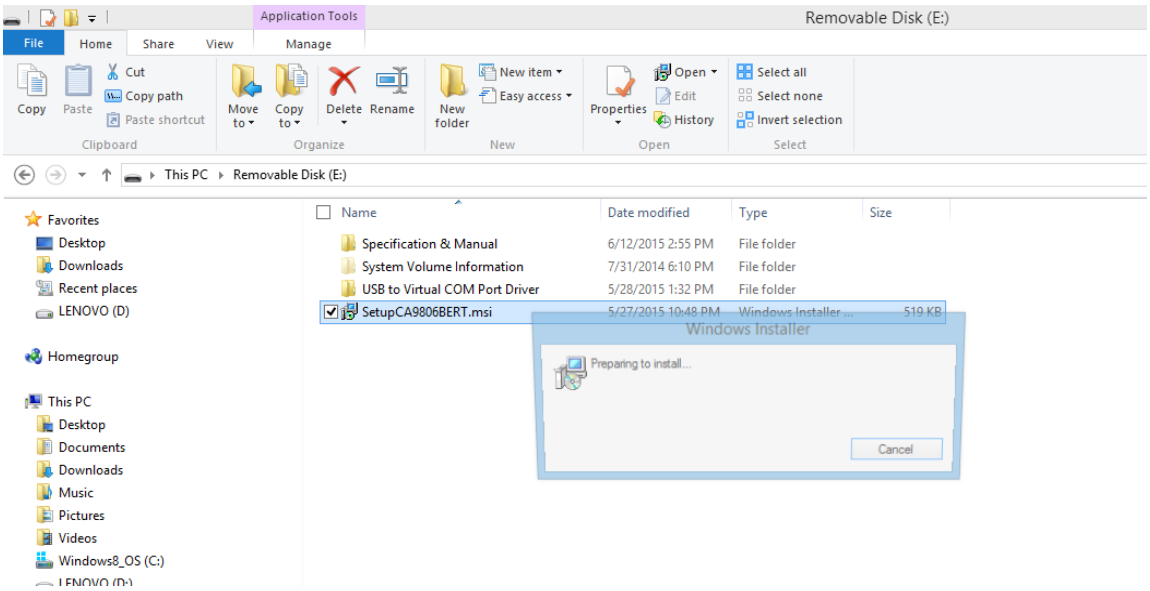
Accessories Included:

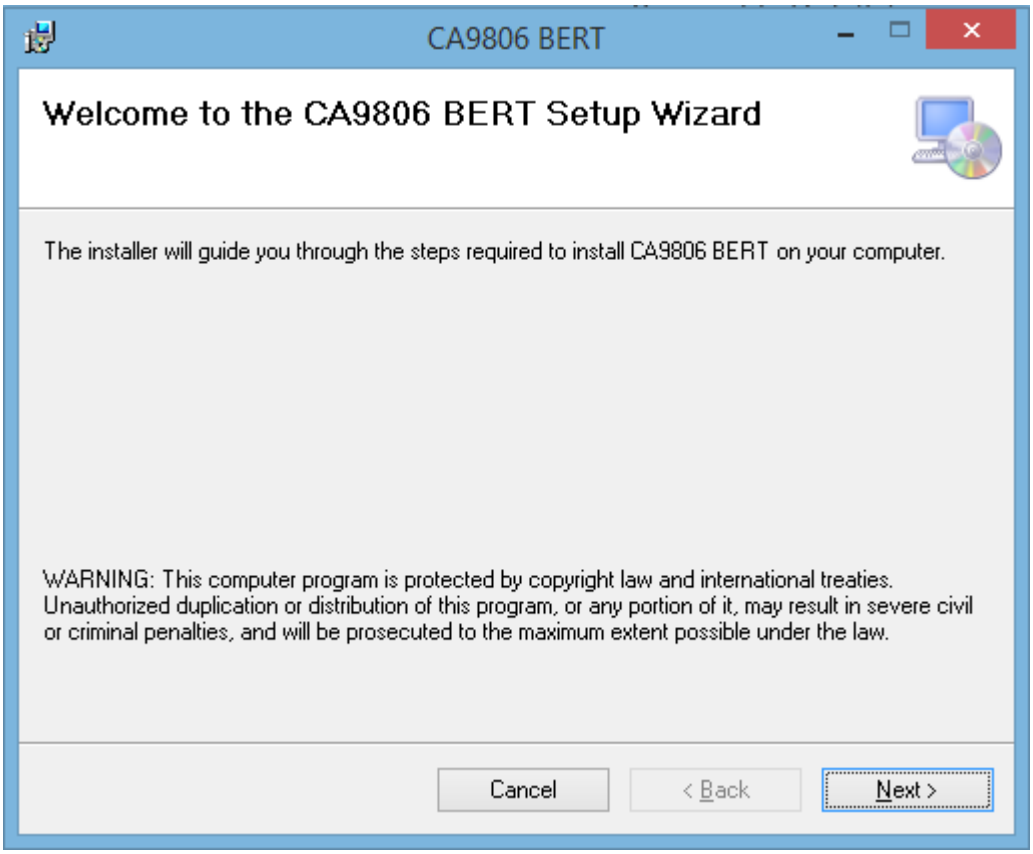
- User Software GUI
- User Manual
- AC-DC Power Adapter
- PC Interface USB cable

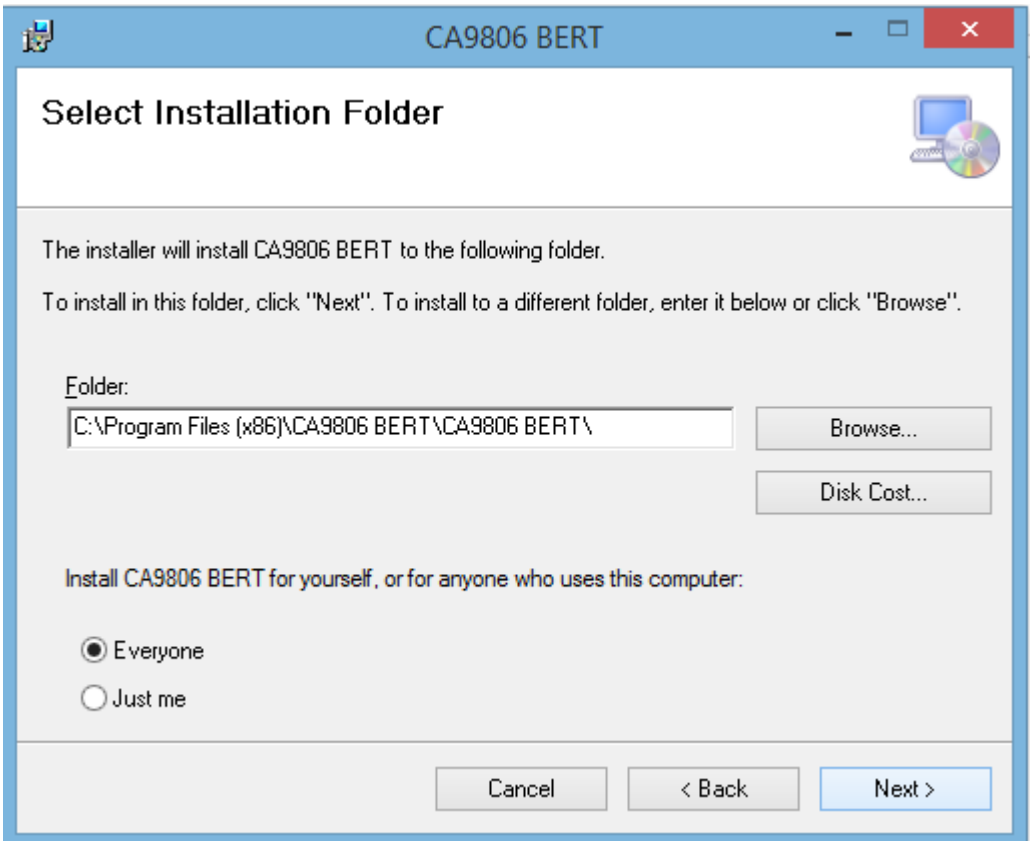
Installing the Software and Starting the Application

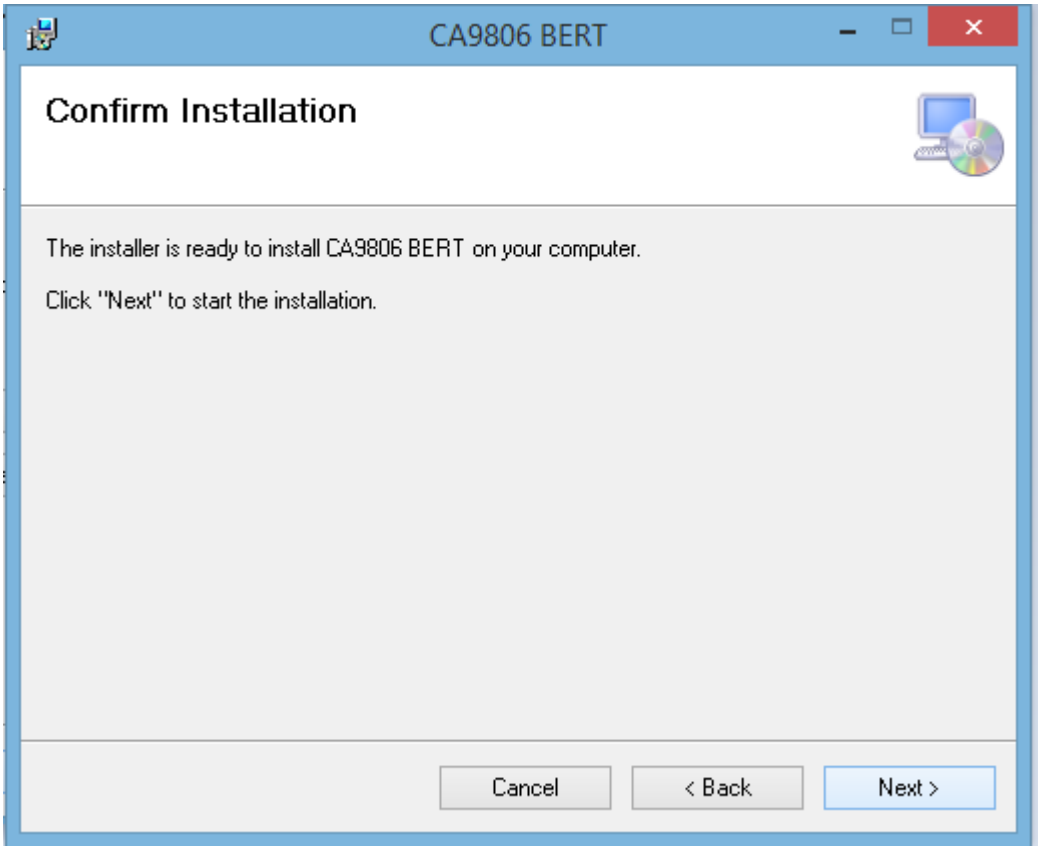
1. UC INSTRUEMNTS CA9806 provide an USB memory stick with CA9806 specification, user manual and user GUI software.
2. Plug the USB memory stick into one of computer USB port.
3. Find and double click "SetupCA9806BERT.msi" in the USB driver files, the application setup will be installed.

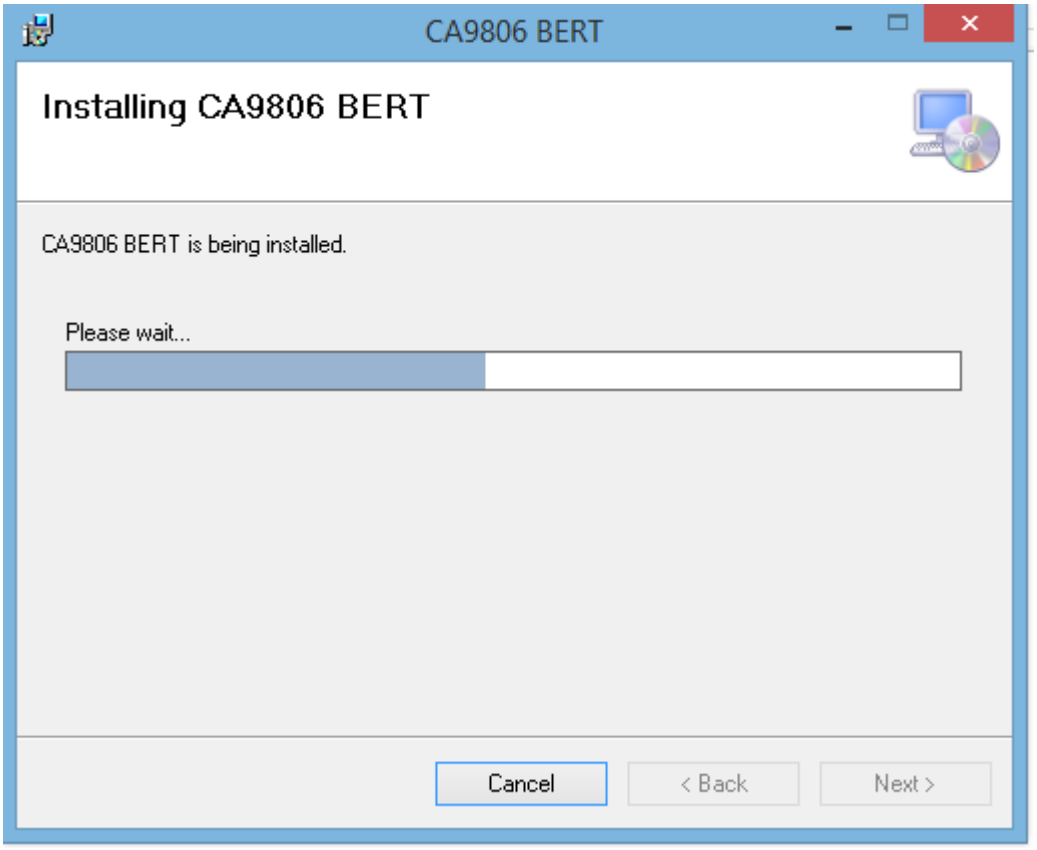


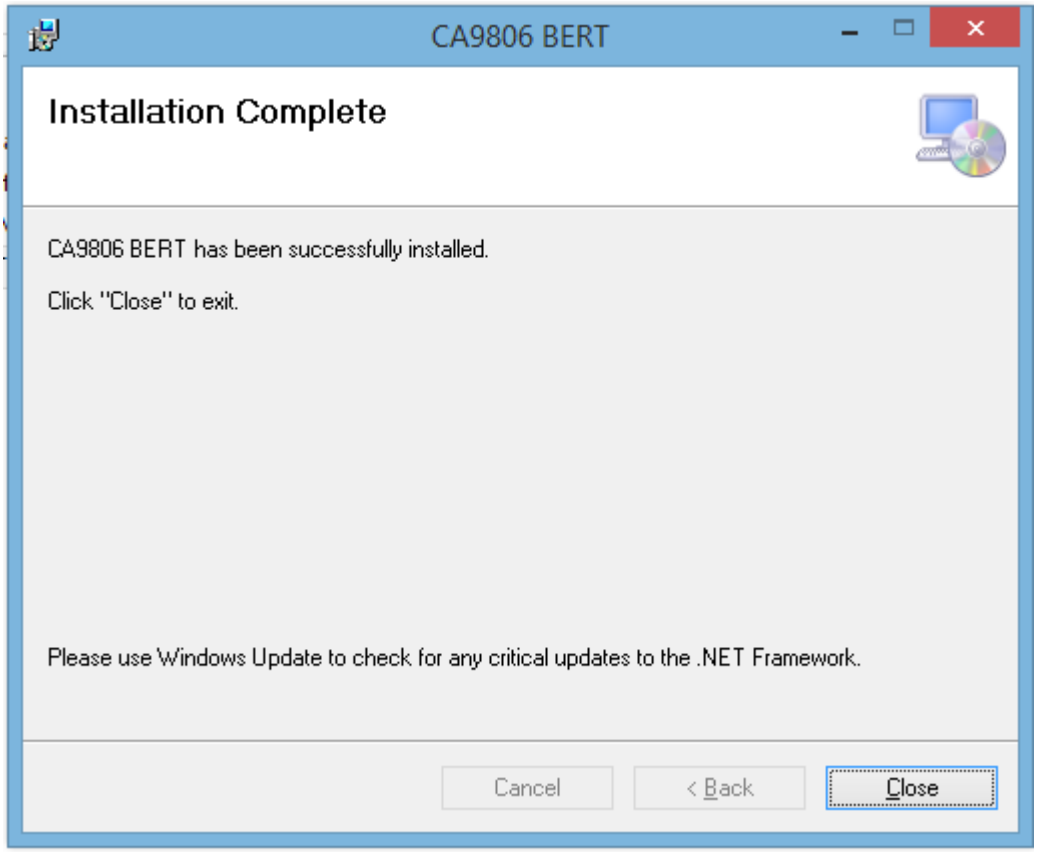

Application Tools
Removable Disk (E:)
File
Home
Share
View
Manage
Copy
Paste
Cut
Copy path
Paste shortcut
Clipboard
Move to
Copy to
Delete
Rename
Organize
New item
Easy access
New folder
New
Properties
Open
Edit
History
Open
Select all
Select none
Invert selection
Select
This PC
Removable Disk (E:)
Favorites
Desktop
Downloads
Recent places
LENOVO (D)
Homegroup
This PC
Desktop
Documents
Downloads
Music
Pictures
Videos
Windows8_OS (C:)
Name
Date modified
Type
Size
Specification & Manual
6/12/2015 2:55 PM
File folder
System Volume Information
7/31/2014 6:10 PM
File folder
USB to Virtual COM Port Driver
5/28/2015 1:32 PM
File folder
SetupCA9806BERT.msi
519 KB
Windows Installer
Preparing to install...
Cancel


CA9806 BERT
Welcome to the CA9806 BERT Setup Wizard
The installer will guide you through the steps required to install CA9806 BERT on your computer.
WARNING: This computer program is protected by copyright law and international treaties. Unauthorized duplication or distribution of this program, or any portion of it, may result in severe civil or criminal penalties, and will be prosecuted to the maximum extent possible under the law.
Cancel
< Back
Next >

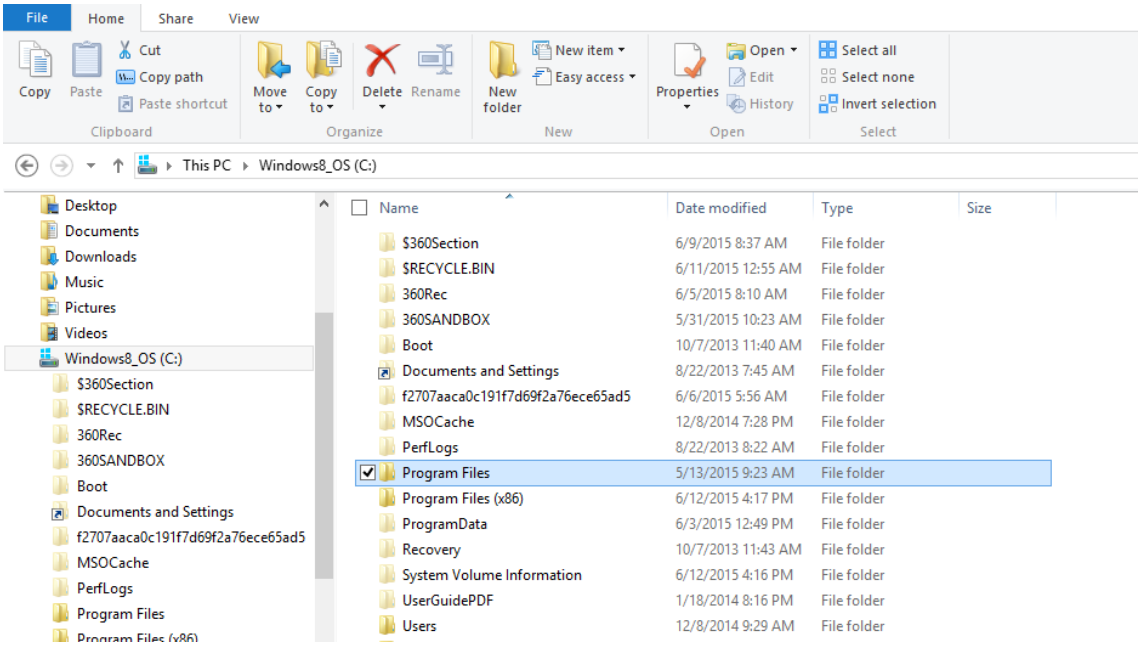

CA9806 BERT
Select Installation Folder
The installer will install CA9806 BERT to the following folder.
To install in this folder, click "Next". To install to a different folder, enter it below or click "Browse".
Folder:
C:\Program Files (x86)\CA9806 BERT\CA9806 BERT\
Browse...
Disk Cost...
Install CA9806 BERT for yourself, or for anyone who uses this computer:
Everyone
Just me
Cancel
< Back
Next >


CA9806 BERT
Confirm Installation
The installer is ready to install CA9806 BERT on your computer.
Click "Next" to start the installation.
Cancel
< Back
Next >


CA9806 BERT
Installing CA9806 BERT
CA9806 BERT is being installed.
Please wait...
Cancel
< Back
Next >


CA9806 BERT
Installation Complete
CA9806 BERT has been successfully installed.
Click "Close" to exit.
Please use Windows Update to check for any critical updates to the .NET Framework.
Cancel
< Back
Close

Go to:


File
Home
Share
View
Copy
Paste
Cut
Copy path
Paste shortcut
Clipboard
Move to
Copy to
Delete
Rename
Organize
New folder
New item
Easy access
New
Properties
Open
Edit
History
Open
Select all
Select none
Invert selection
Select
This PC
Windows8_OS (C:)
Desktop
Documents
Downloads
Music
Pictures
Videos
Windows8_OS (C:)
$360Section
$RECYCLE.BIN
360Rec
360SANDBOX
Boot
Documents and Settings
f2707aaca0c191f7d69f2a76ece65ad5
MSOCache
PerfLogs
Program Files
Name
Date modified
Type
Size
$360Section 6/9/2015 8:37 AM File folder
$RECYCLE.BIN 6/11/2015 12:55 AM File folder
360Rec 6/5/2015 8:10 AM File folder
360SANDBOX 5/31/2015 10:23 AM File folder
Boot 10/7/2013 11:40 AM File folder
Documents and Settings 8/22/2013 7:45 AM File folder
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MSOCache 12/8/2014 7:28 PM File folder
PerfLogs 8/22/2013 8:22 AM File folder
Program Files 5/13/2015 9:23 AM File folder
Program Files (x86) 6/12/2015 4:17 PM File folder
ProgramData 6/3/2015 12:49 PM File folder
Recovery 10/7/2013 11:43 AM File folder
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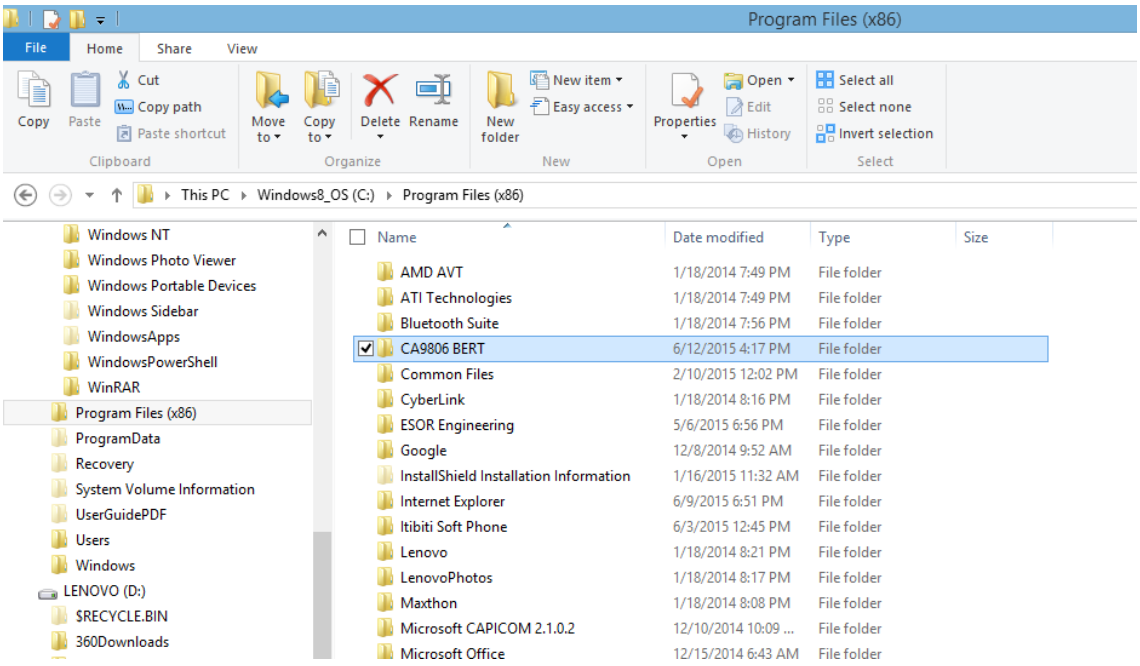
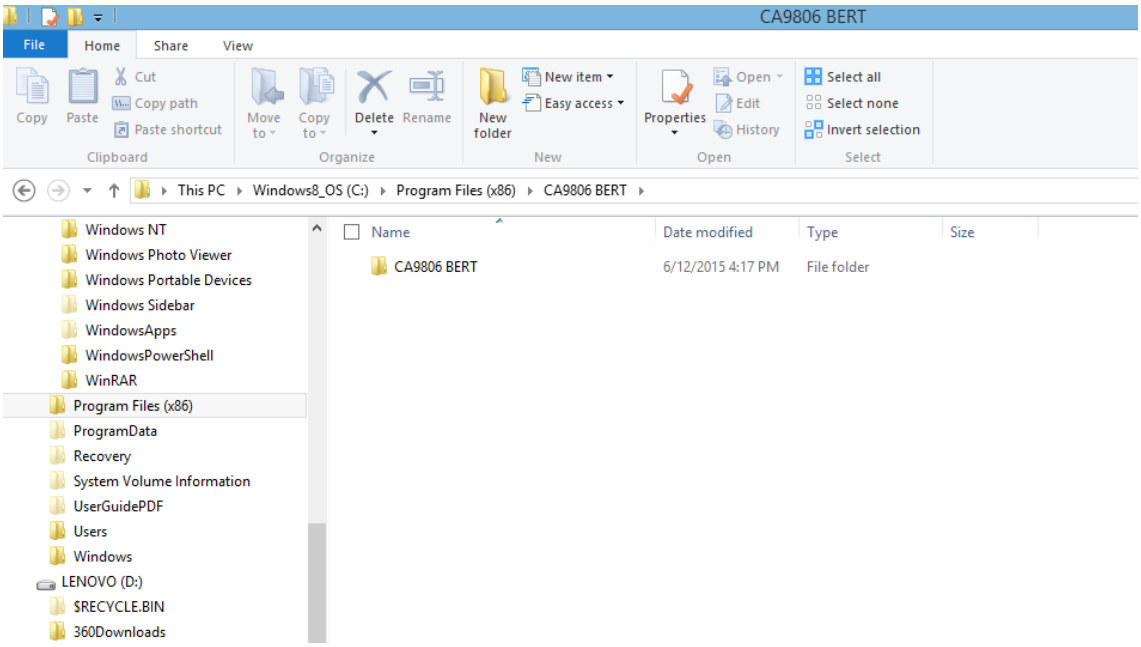
UserGuidePDF 1/18/2014 8:16 PM File folder
Users 12/8/2014 9:29 AM File folder


Program Files (x86)
File
Home
Share
View
Copy
Paste
Cut
Copy path
Paste shortcut
Clipboard
Move to
Copy to
Delete
Rename
Organize
New folder
New item
Easy access
New
Properties
Open
Edit
History
Open
Select all
Select none
Invert selection
Select
This PC
Windows8_OS (C:)
Program Files (x86)
Windows NT
Windows Photo Viewer
Windows Portable Devices
Windows Sidebar
WindowsApps
WindowsPowerShell
WinRAR
Program Files (x86)
ProgramData
Recovery
System Volume Information
UserGuidePDF
Users
Windows
LENOVO (D:)
$RECYCLE.BIN
360Downloads
Name
Date modified
Type
Size
AMD AVT 1/18/2014 7:49 PM File folder
ATI Technologies 1/18/2014 7:49 PM File folder
Bluetooth Suite 1/18/2014 7:56 PM File folder
CA9806 BERT 6/12/2015 4:17 PM File folder
Common Files 2/10/2015 12:02 PM File folder
CyberLink 1/18/2014 8:16 PM File folder
ESOR Engineering 5/6/2015 6:56 PM File folder
Google 12/8/2014 9:52 AM File folder
InstallShield Installation Information 1/16/2015 11:32 AM File folder
Internet Explorer 6/9/2015 6:51 PM File folder
Itibiti Soft Phone 6/3/2015 12:45 PM File folder
Lenovo 1/18/2014 8:21 PM File folder
LenovoPhotos 1/18/2014 8:17 PM File folder
Maxthon 1/18/2014 8:08 PM File folder
Microsoft CAPICOM 2.1.0.2 12/10/2014 10:09 ... File folder
Microsoft Office 12/15/2014 6:43 AM File folder


CA9806 BERT
File
Home
Share
View
Copy
Paste
Cut
Copy path
Paste shortcut
Clipboard
Move to
Copy to
Delete
Rename
Organize
New folder
New item
Easy access
New
Properties
Open
Edit
History
Open
Select all
Select none
Invert selection
Select
This PC
Windows8_OS (C:)
Program Files (x86)
CA9806 BERT
Windows NT
Windows Photo Viewer
Windows Portable Devices
Windows Sidebar
WindowsApps
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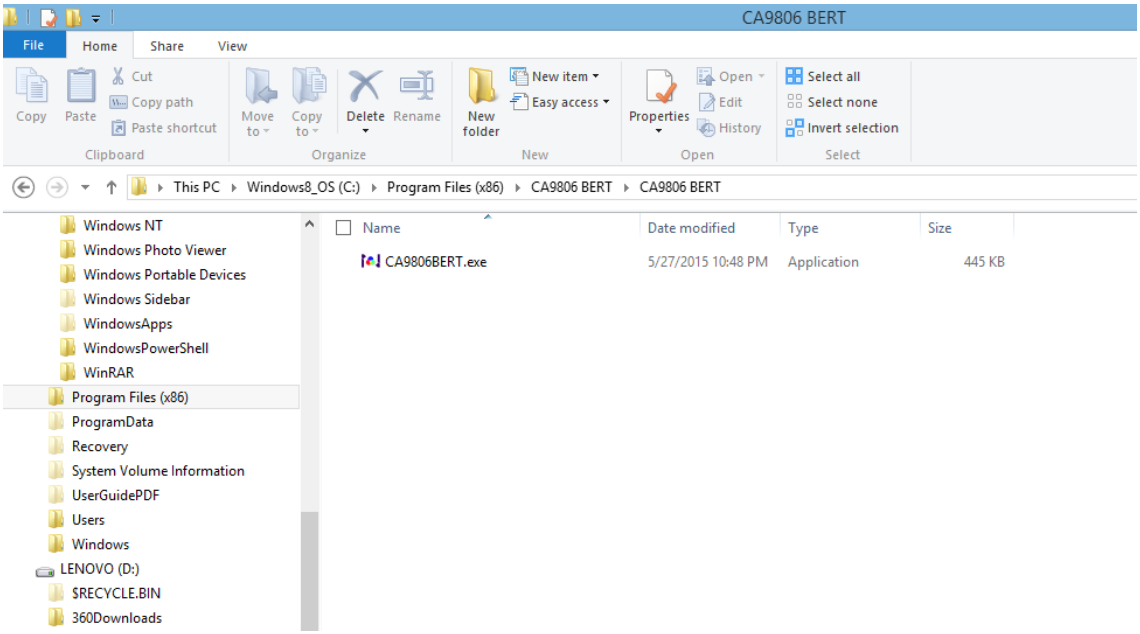
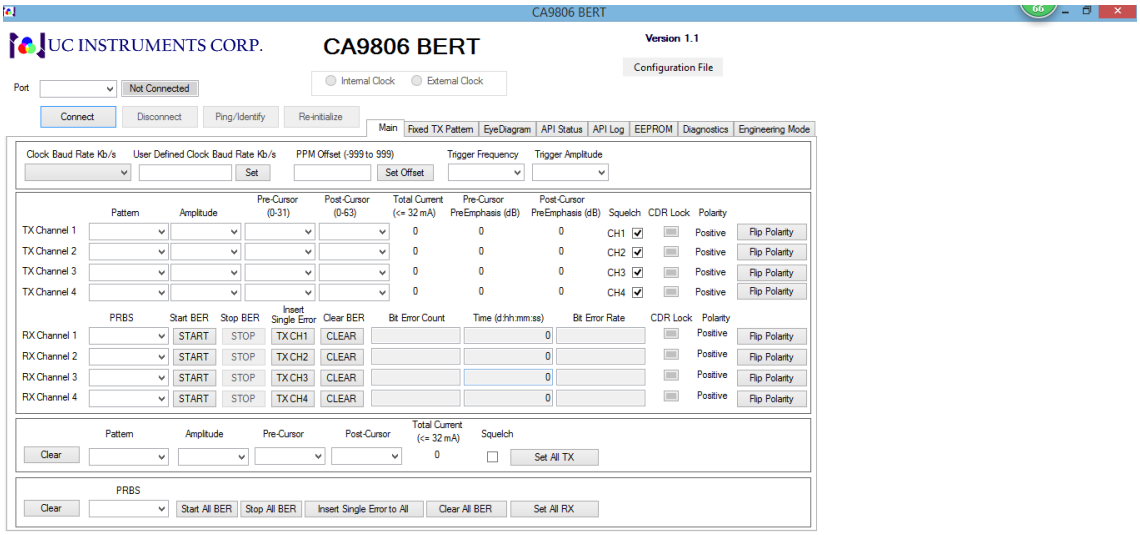
WinRAR
Program Files (x86)
ProgramData
Recovery
System Volume Information
UserGuidePDF
Users
Windows
LENOVO (D:)
$RECYCLE.BIN
360Downloads
Name
Date modified
Type
Size
CA9806 BERT
6/12/2015 4:17 PM
File folder


CA9806 BERT
File
Home
Share
View
Copy
Paste
Cut
Copy path
Paste shortcut
Clipboard
Move to
Copy to
Delete
Rename
Organize
New folder
New item
Easy access
New
Properties
Open
Edit
History
Open
Select all
Select none
Invert selection
Select
This PC
Windows8_OS (C:)
Program Files (x86)
CA9806 BERT
CA9806 BERT
Windows NT
Windows Photo Viewer
Windows Portable Devices
Windows Sidebar
WindowsApps
WindowsPowerShell
WinRAR
Program Files (x86)
ProgramData
Recovery
System Volume Information
UserGuidePDF
Users
Windows
LENOVO (D:)
$RECYCLE.BIN
360Downloads
Name
Date modified
Type
Size
CA9806BERT.exe
5/27/2015 10:48 PM
Application
445 KB

Double click “CA9806BERT.exe” CA9806 GUI was installed and run as below:



4. If computer does not find the driver, go to "Control Panel"-->"Hardware and Sound"
   -->"Devices and Printers"-->"Device Manger" to update USB driver.

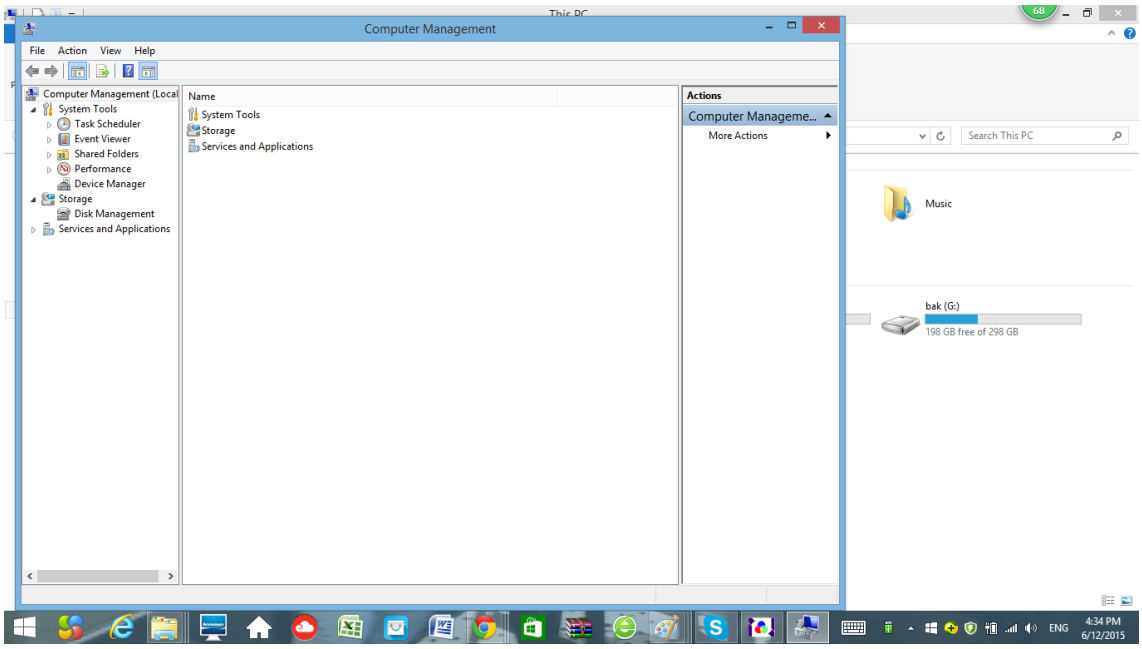
   Got to USB stick “ Driver” fold → “USB to Virtual COM Port Driver” → install Virtual COM port driver.

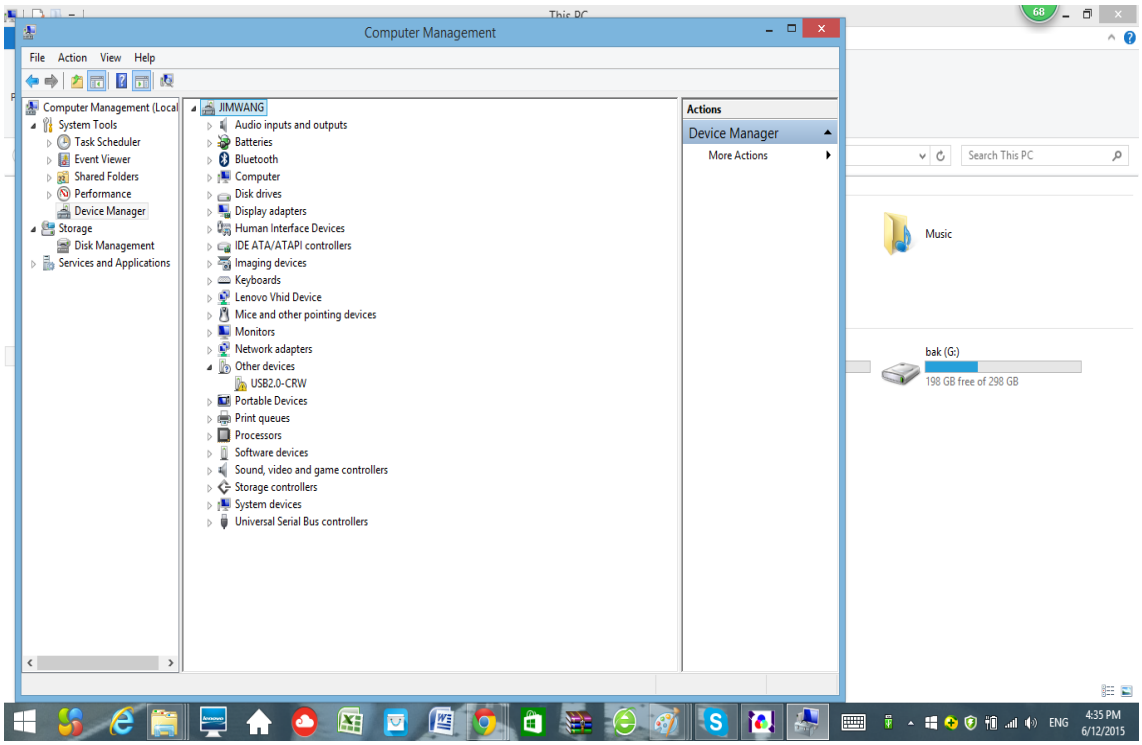
5. Click application “CA9806BERT.exe” file to run the application.

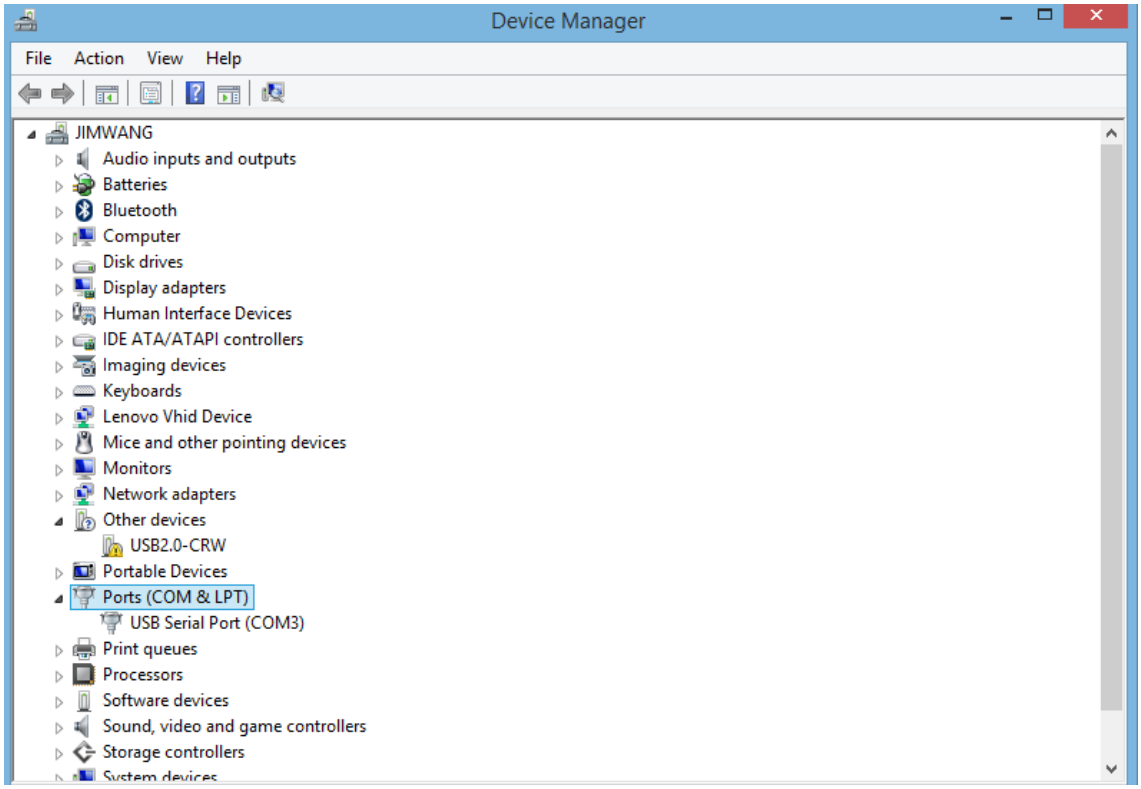
GUI Interface:

1. Find USB communication port;

After all hardware connected and CA9806 was installed in computer, Power on CA9806 BERT and Agilent 86100C mainframe. Go to “Computer Management” page to find USB port #:





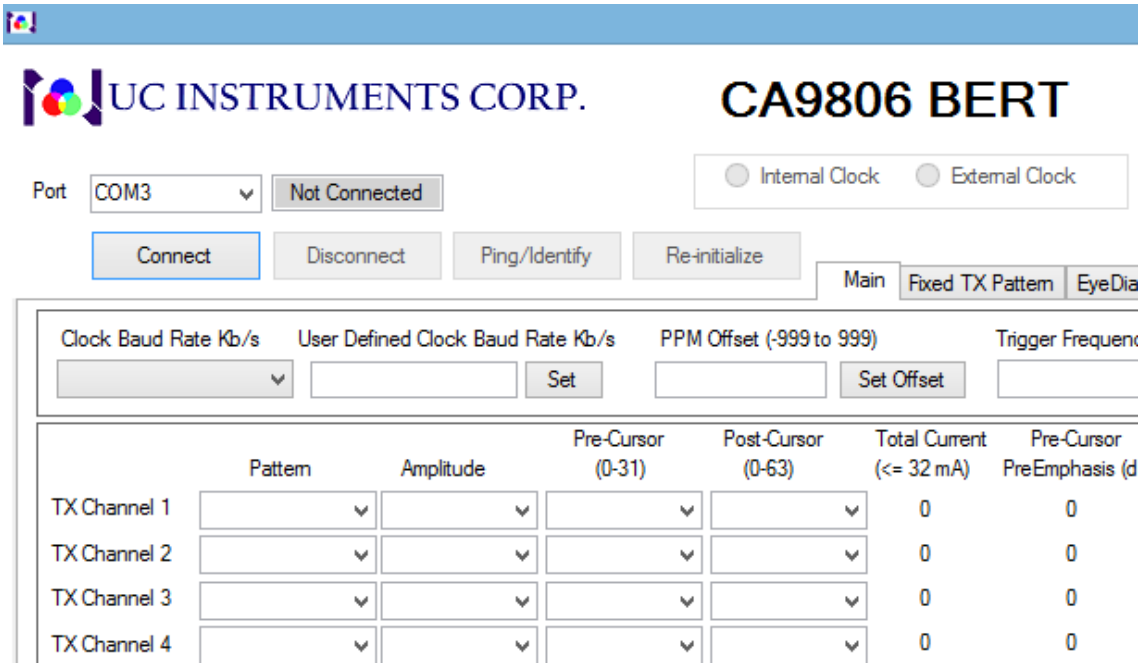


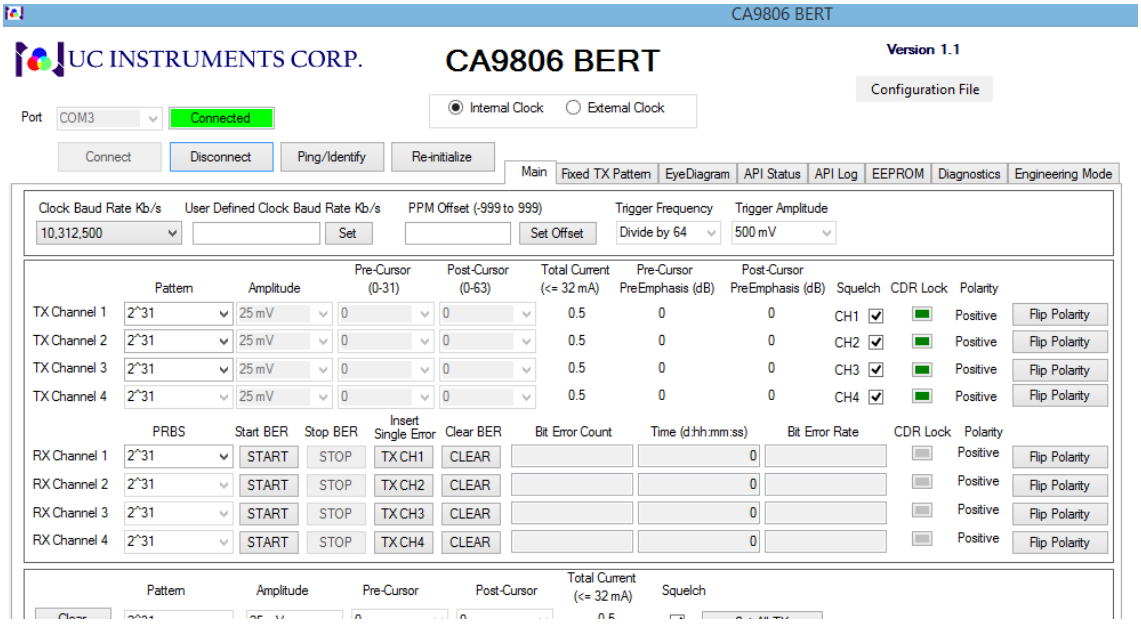
If you find above pictures' USB port location, the CA9806 software was installed and USB port was found.

If you cannot find above USB port information, you need go back to reinstall USB driver.

2. USB communication port connect

Go to CA9806 main manual, fill in USB communication port into USB port # and click connect, you will see CA9806 front panel right side LED blinking from yellow to green. That means CA9806 connected with computer GUI. CA9806 GUI port set from Not Connected changed into Connected and turn to green color.





3. Main manual function.

After USB build up connection with computer GUI, we can start use CA9806 to generate PPG signal.

PPG Clock output Baud Rate set up

Go to “User Defined Clock Baud Rate Kb/s” box, fill in the clock baud rate you want and click “set” , you will see CA9806 front panel right side LED blinking from yellow to green, and the clock baud rate was set to your want. CA9806 clock baud rate can be set from 1 G to 17 G and rate.

Trigger Frequency Setup:

Click “Trigger Frequency” pull up menu, you can see “Divide by 2, 4, 8, … 64”. We prefer default select “Divide by 64”. This will cause the smallest jitter.

Trigger Amplitude:

Click “Trigger amplitude” pull up menu, you will see the trigger out amplitude from 0 mV to 800 mW. We prefer customers select 500 mW for normal application.

TX Channel port active:

On main menu page, there are 4 Channel TX and 4 Channels RX set up check. Each CA9806 BERT with 4 channels TX ports.

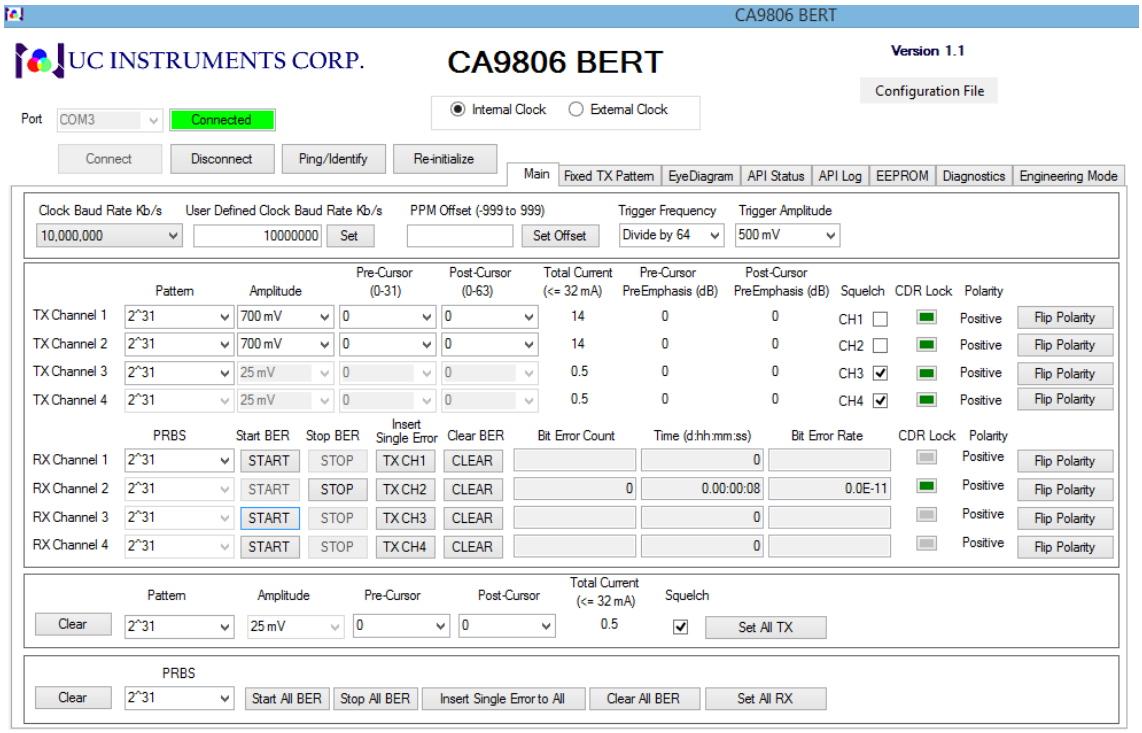
Click “Squelch” check mark to select which TX channel active user want and the TX was unlocked.

PPG Pattern Mode Select :

Click TX channel “Pattern” pull up menu, customers can select PRBS 2^7-1, 2^9-1, 2^{11}-1, 2^{15}-1, 2^{23}-1, 2^{31}-1; 2^{58}-1, Fixed Pattern that customers want.

PPG Amplitude

Click TX channel “Amplitude” pull up menu, customers can select 25 mV, 50 mV, …500 mV, …700 mV, … 1600 mV, very big range. Normally customer select 700 mV output. CA9806 can provide 25 ~ 1600 mV very broad high output signal.



TX channels also provide “Pre-cursor”, “Post-cursor”, “CDR Lock”, Polarity” select function.

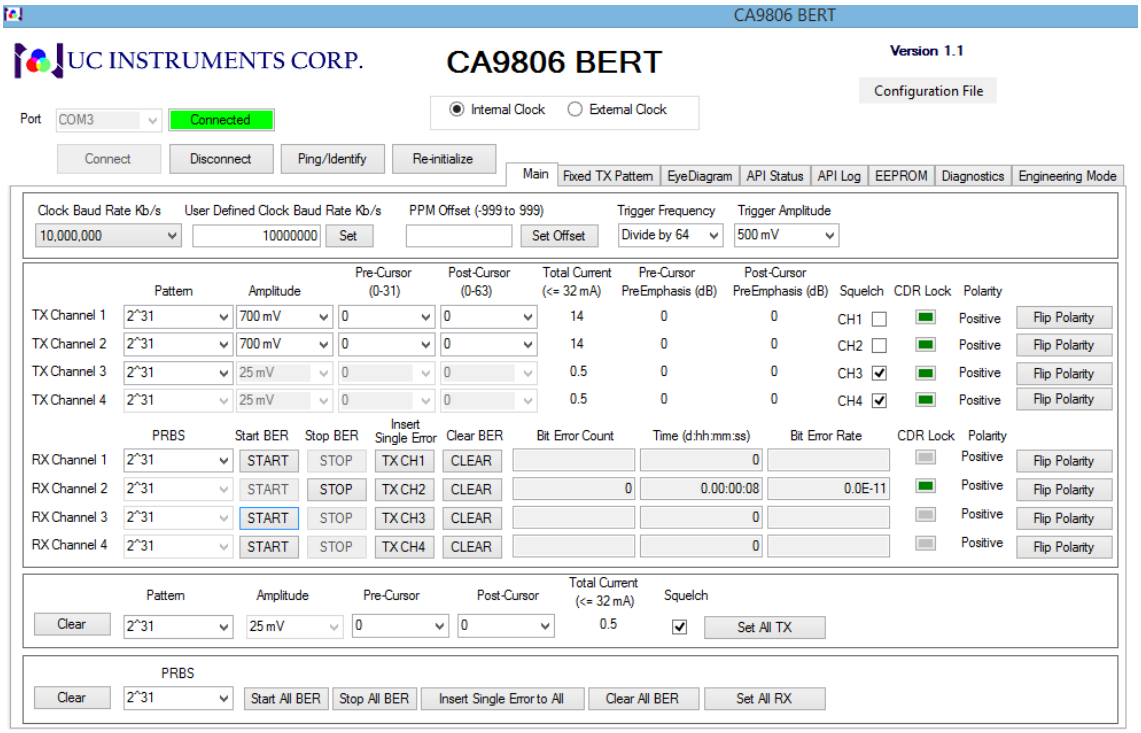
Error Detector

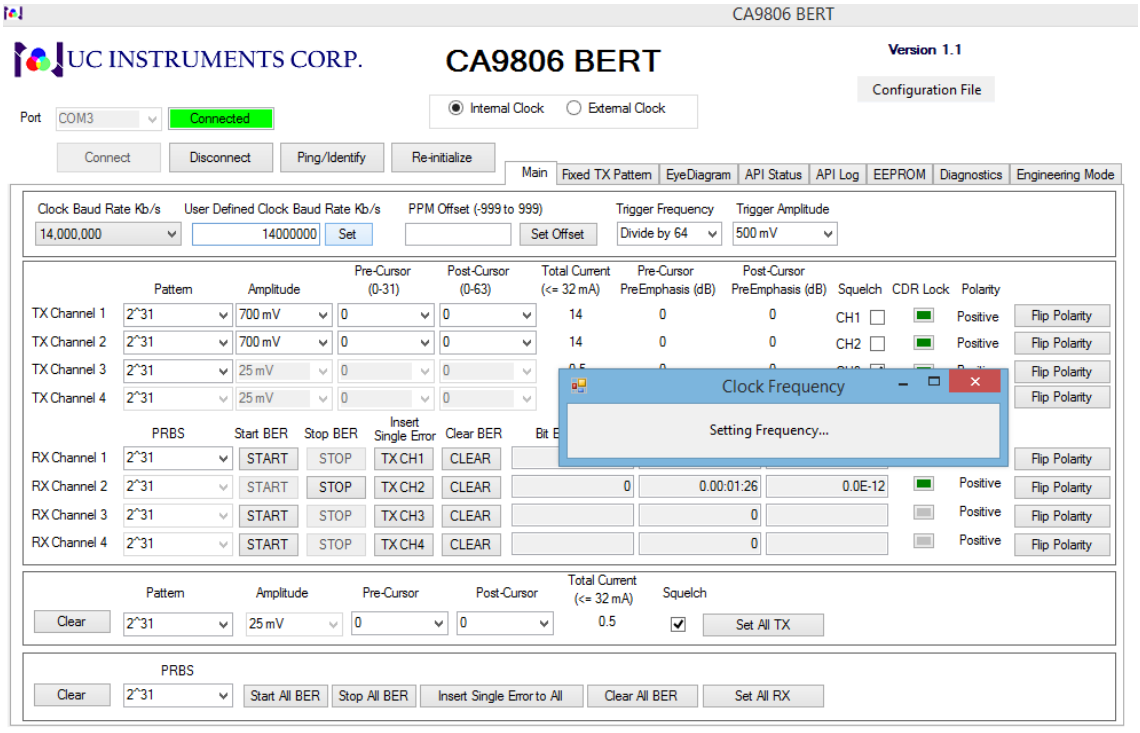
In order to perform error detector function, normally need loop back TX signal to RX port.

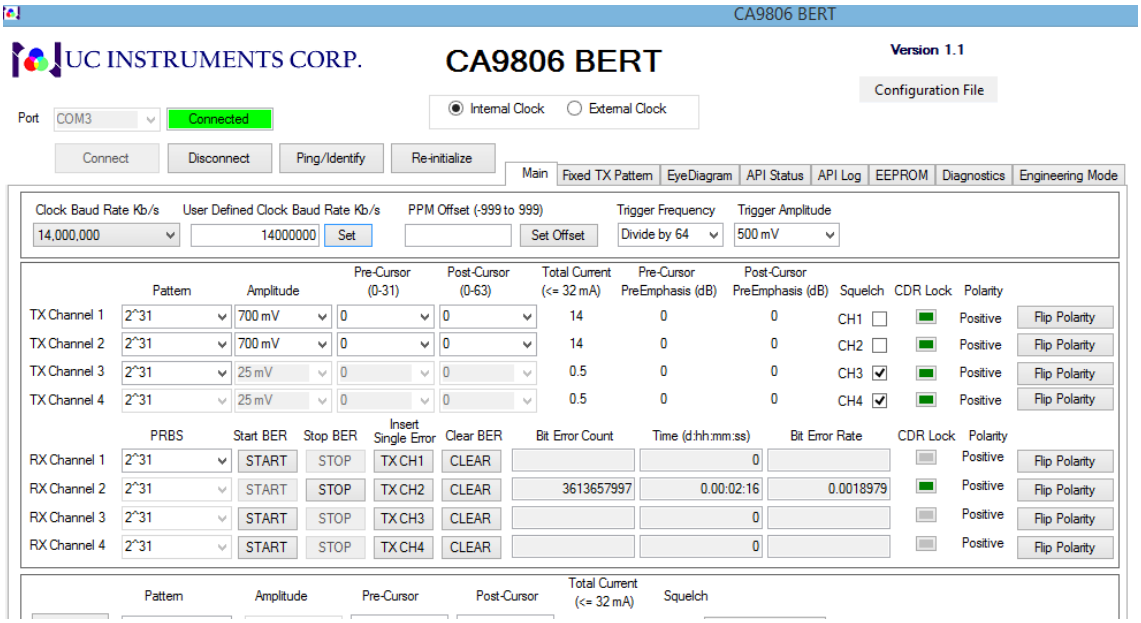
After you loop back any channel TX signal to error detector(with or without DUT), click the RX channel “START” menu, Error detector start testing and “Bit Error Count”, “Time”, “Bit Error Rate” start work and show up testing data.

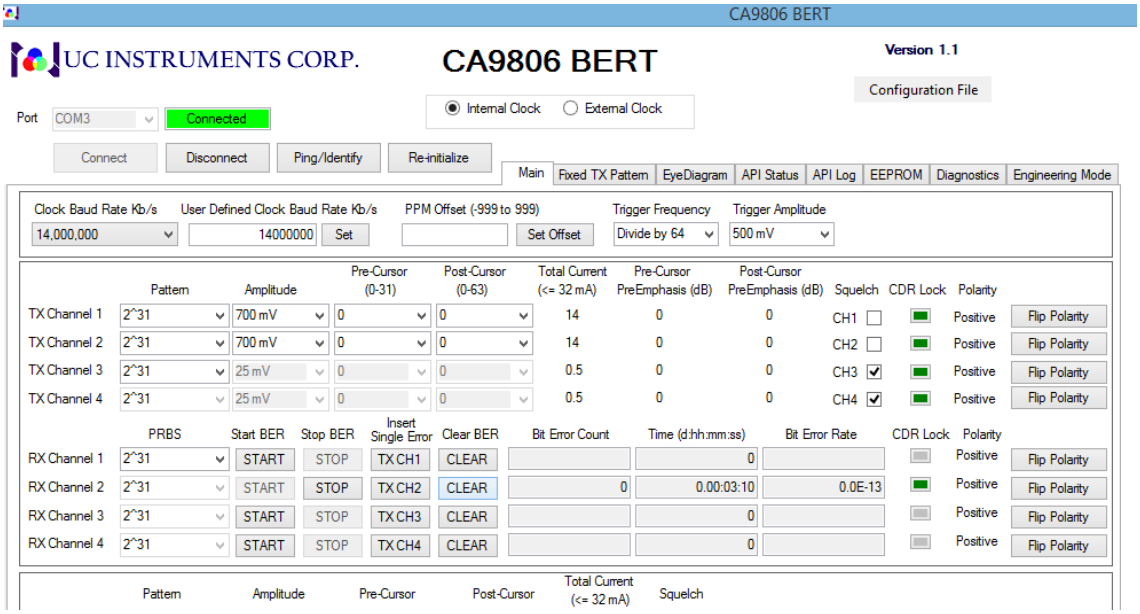
When you change TX clock baud rate, the CA9806 reset the setup parameters, customers need click the RX “STOP” menu, “CLEAR” menu to clear old data. Re-click “STSRT” menu, the new ERROR detector testing data will be updated.

On the bottom Main menu, there are also provide “Set All TX” and “Set All RX” menu function to quick set all 4 channels TX and RX parameters quickly.









4. Build-in 8.5 ~ 15 Gbps Eye Diagram Function

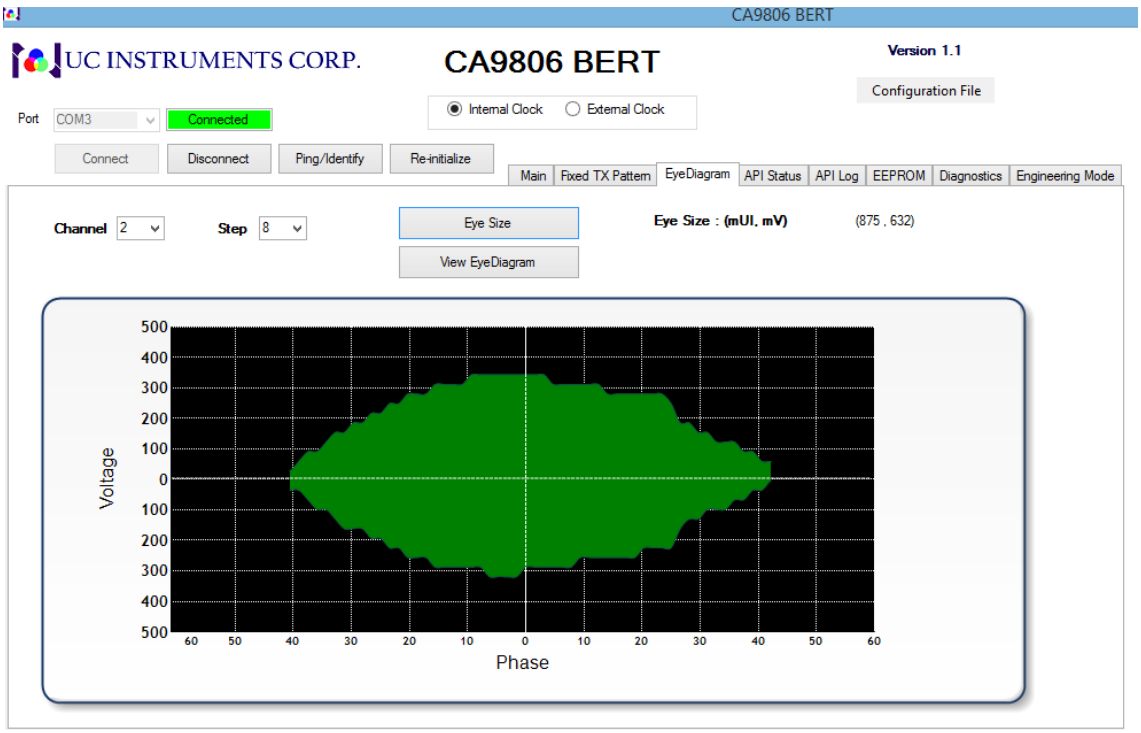
CA9806 provide a special build-in 8.5 ~ 15 Gbps eye diagram function. Customers can use it to verify 8.5 ~ 15 Gbps DUT eye diagram performance.

Loop back TX channels with RX channels (or connect after DUT unit RX), Switch “Main” menu to “EyeDiagram” menu. Select the “Channel” (Channel 1 ~ 4 selectable). Select “Step” (there are Step options 1, 2, 4, 8. The step 1 is the

lowest speed and the highest resolution testing. Step 8 is the most fast and the lowest resolution testing).

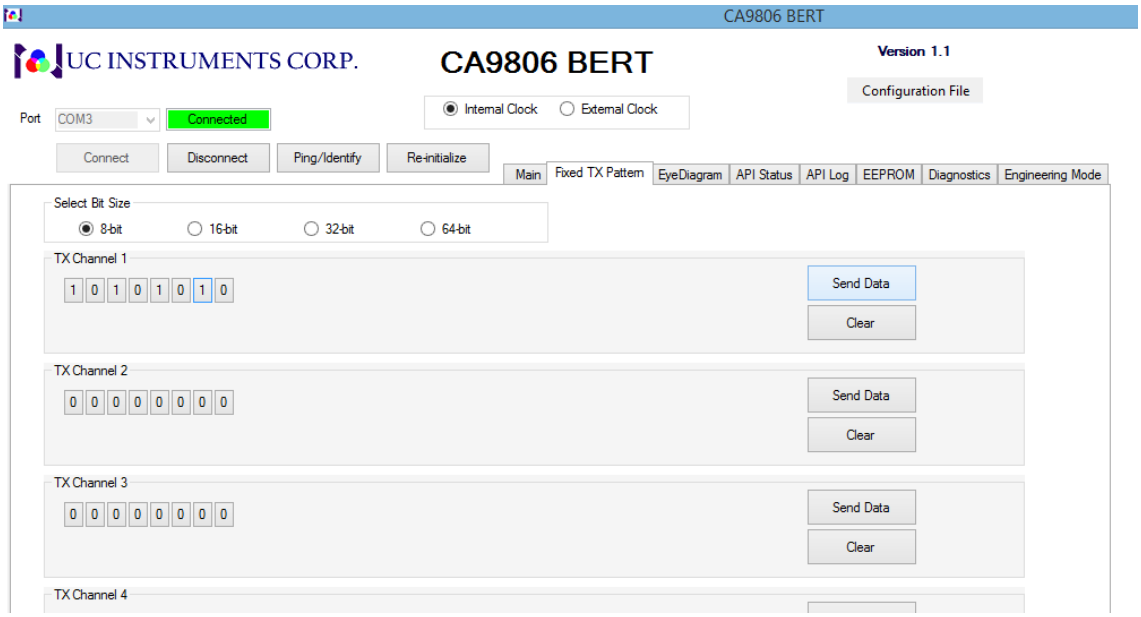
Click “Eys Size” menu, to get testing range;

Click “View EyeDiagram”, start to perform eye-diagram testing.

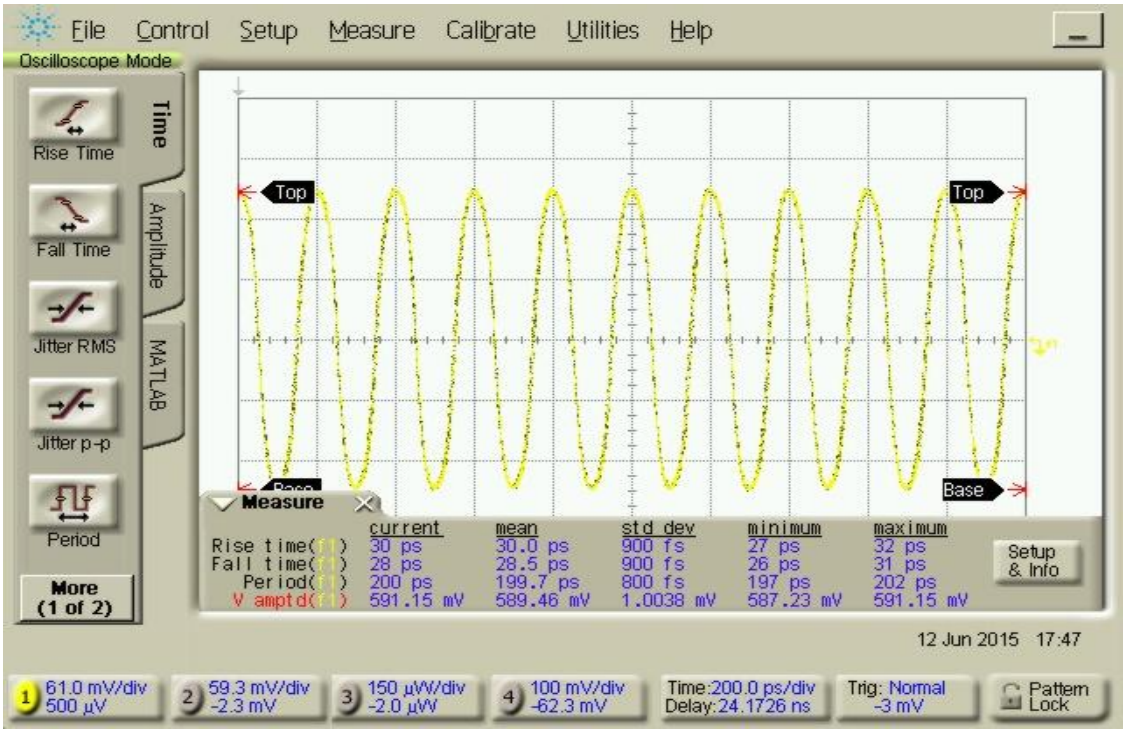


5. Fixed TX Pattern Function

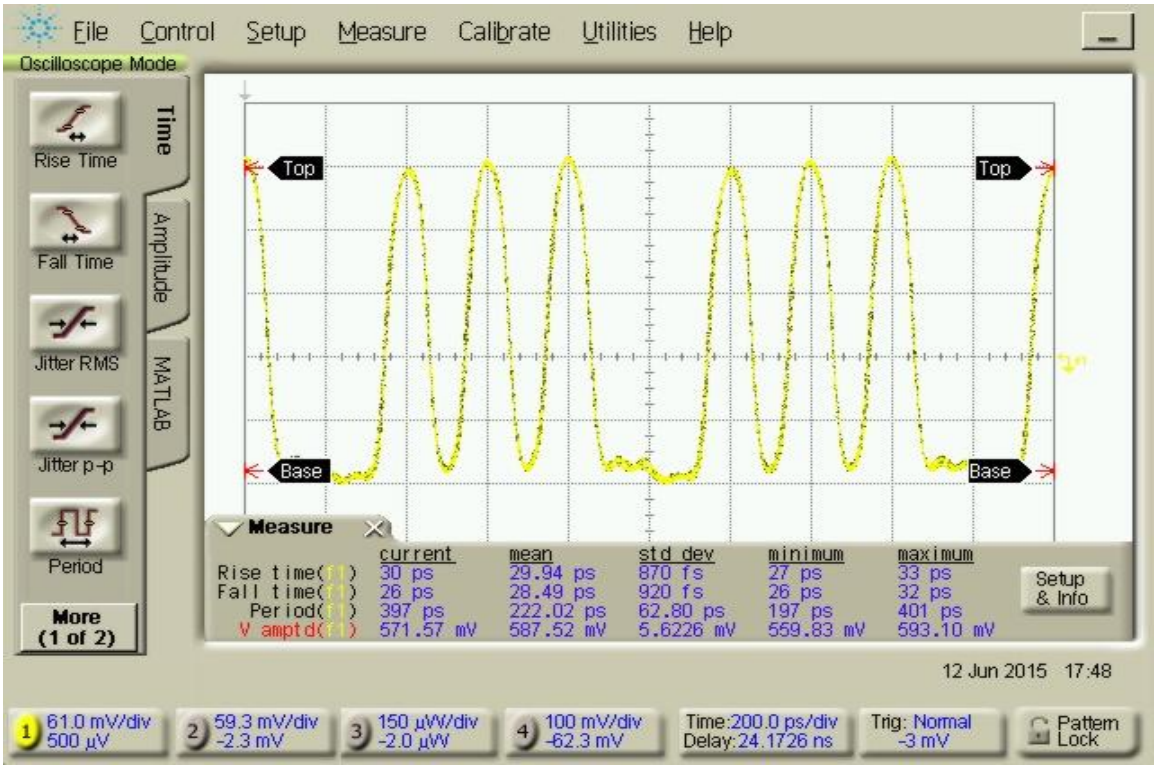
On “Main” menu, we select TX Channel 1 Pattern mode as “Fixed Pattern”. Switch the “Main” menu to “Fixed TX Pattern” interface. Set “ Select Bit Size” as 8 bit.



Set TX Channel 1 bit size as “10101010”. Click “Send Data”, we can get fixed TX pattern from Agilent 86100A + 83483A module screen as below:



Set TX Channel 1 bit size as “10100010”. Click “Send Data”, we can get fixed TX pattern from Agilent 86100A + 83483A module screen as below:

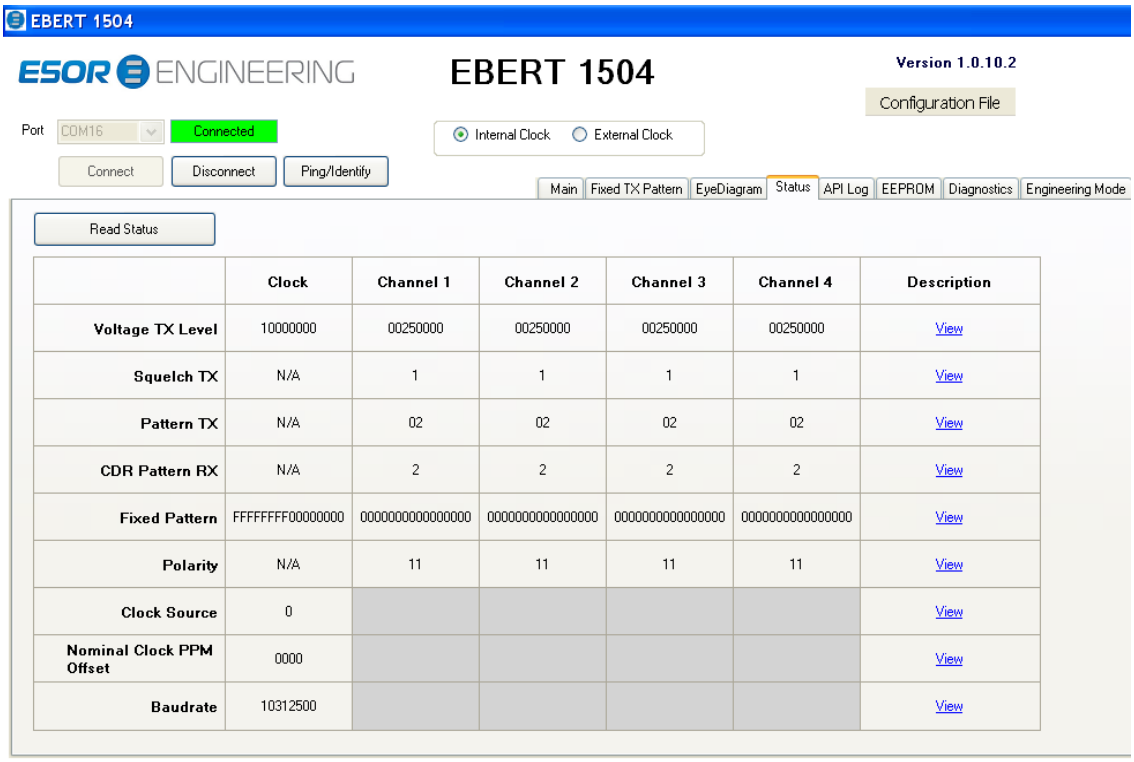


CA9806 Fixed TX Pattern function makes CA9806 as a 4 channels output 0.5 ~ 8.5 GHz signal generator.

6. Others Function

Status Control

a. Status control tab
b. Read status of all control settings using the API command set
c. Click on the description link to find out the API command set for each line item.

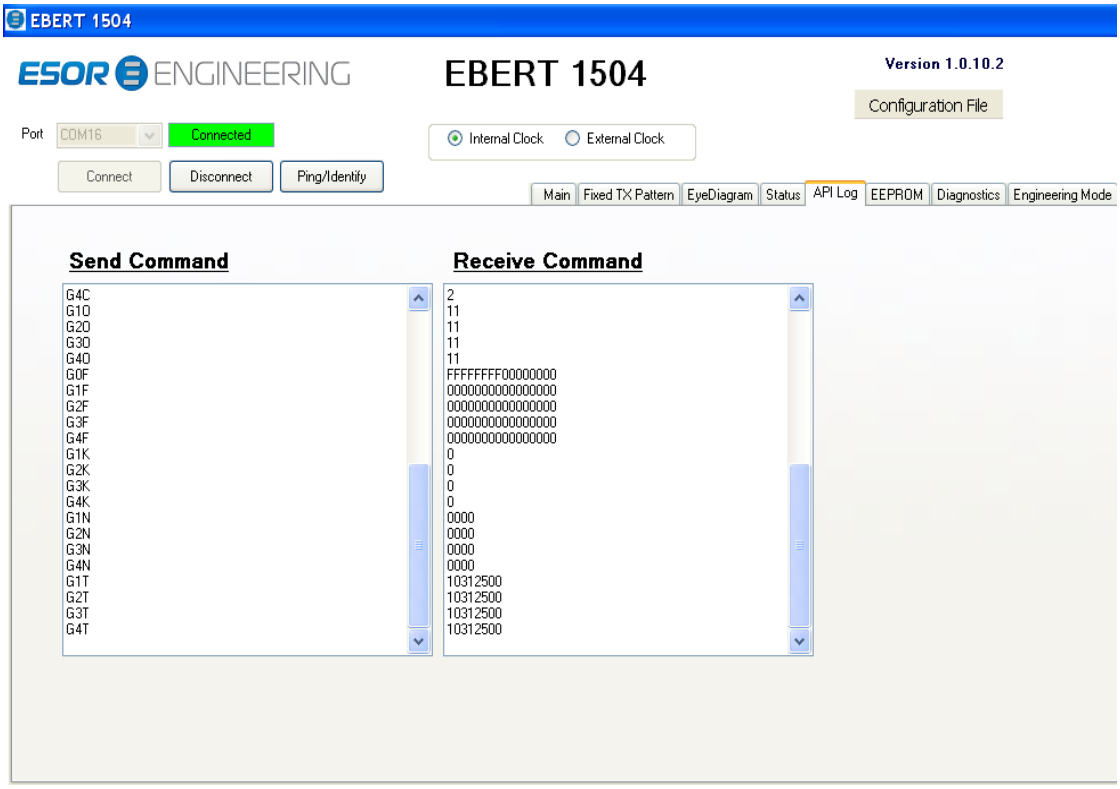


	Clock	Channel 1	Channel 2	Channel 3	Channel 4	Description
Voltage TX Level	10000000	00250000	00250000	00250000	00250000	View
Squelch TX	N/A	1	1	1	1	View
Pattern TX	N/A	02	02	02	02	View
CDR Pattern RX	N/A	2	2	2	2	View
Fixed Pattern	FFFFFFFF00000000	0000000000000000	0000000000000000	0000000000000000	0000000000000000	View
Polarity	N/A	11	11	11	11	View
Clock Source	0					View
Nominal Clock PPM Offset	0000					View
Baudrate	10312500					View

API Control

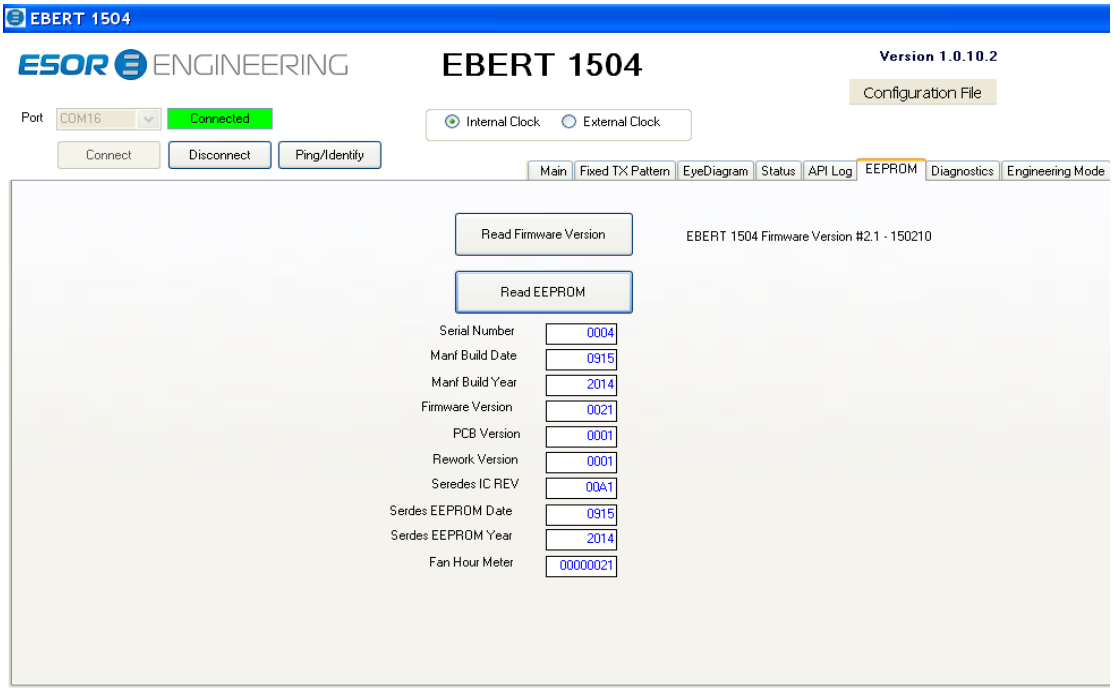
a. API control tab

b. View all API commands that have been sent and received to the 1504 unit, used for getting familiar with the API structures



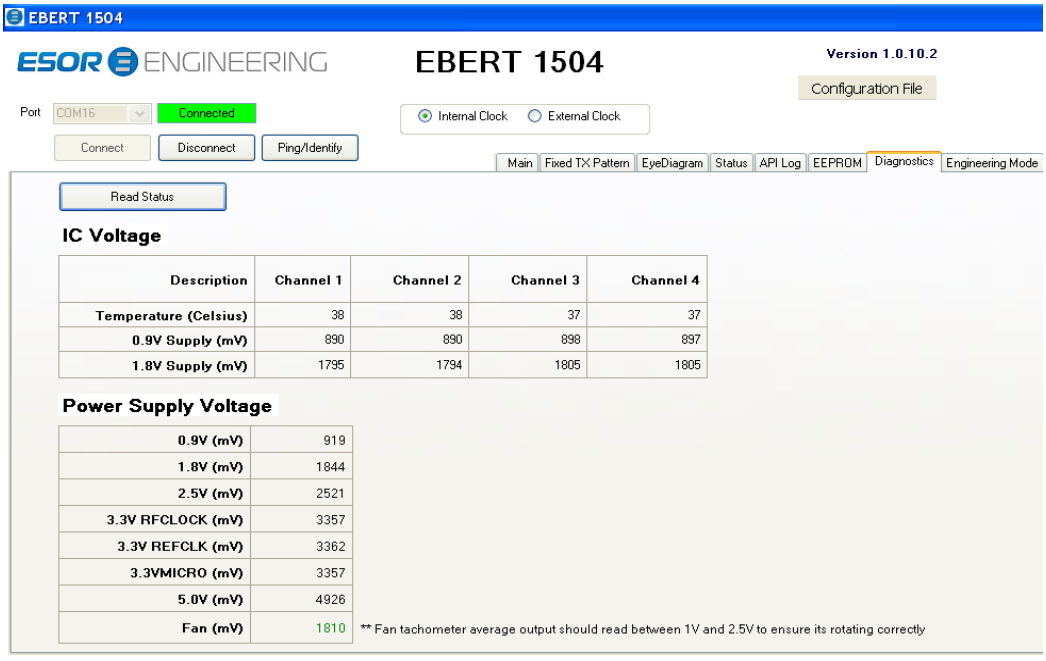
EEPROM control tab

a. Read firmware version button
b. Read Factory EEPROM contents and fan hour meter



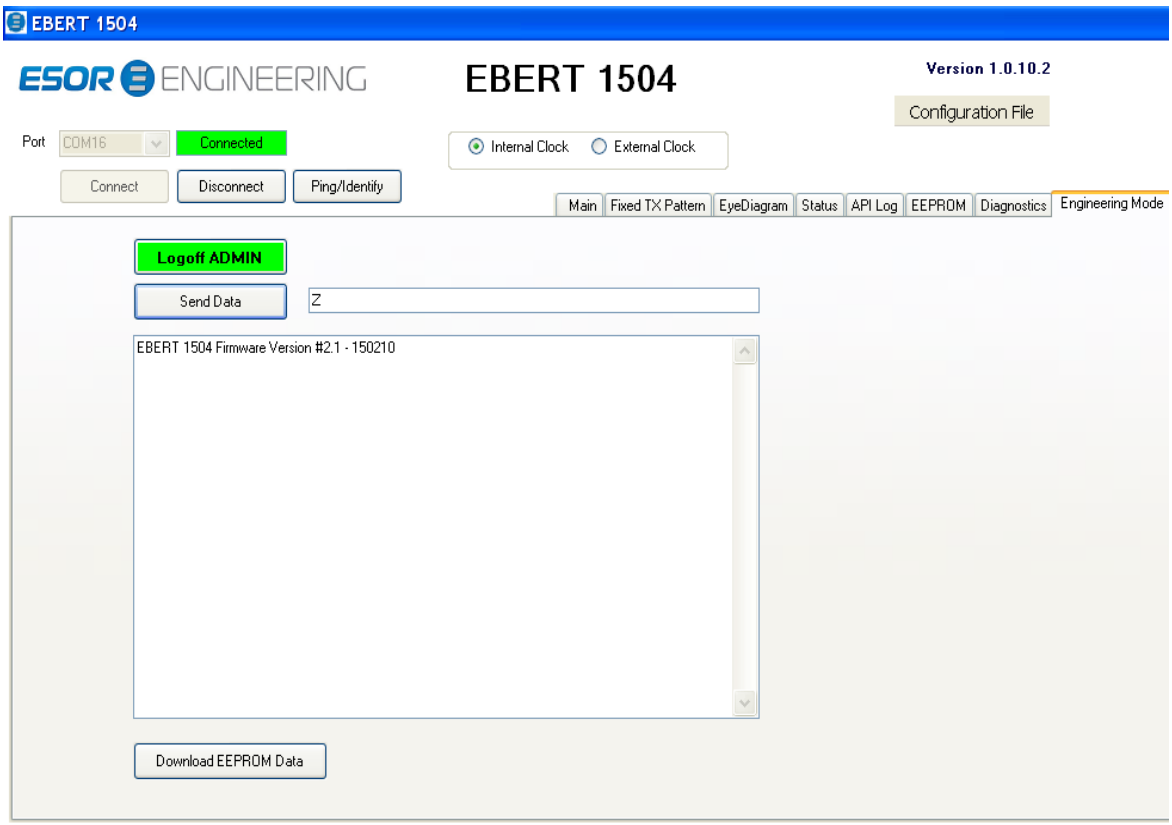
Diagnostics Control Tab

a. Read status botton
b. Power supply voltage rails of the system and fan rotation



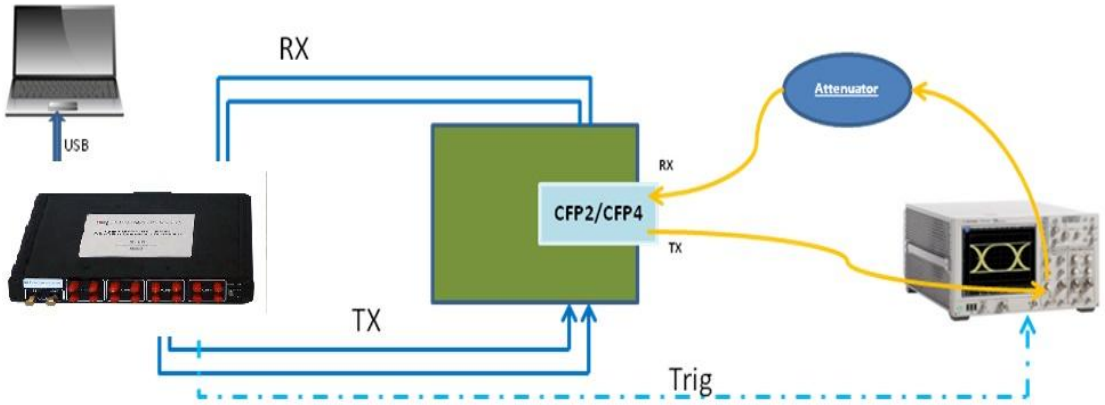
Engineering control tab

a. Send API commands, warning as you are in master mode and the GUI won't be in synchronization with the commands being sent
b. Download EEPROM contents, only used at the factory

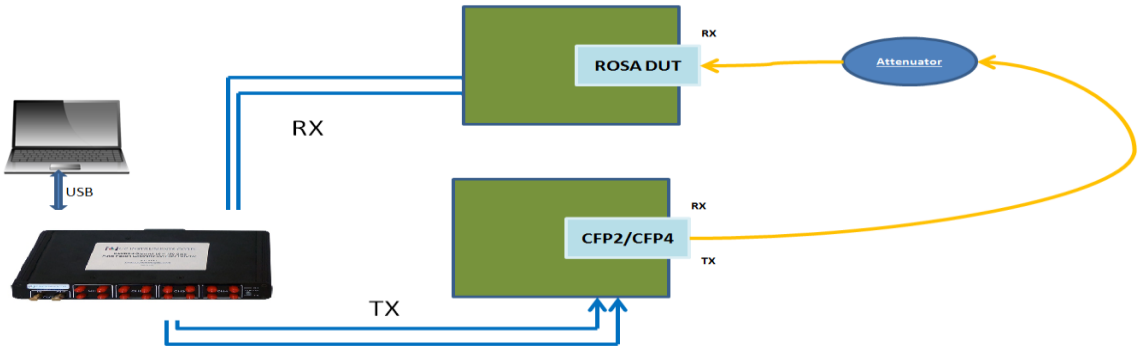


Typical Test Application and Connecting

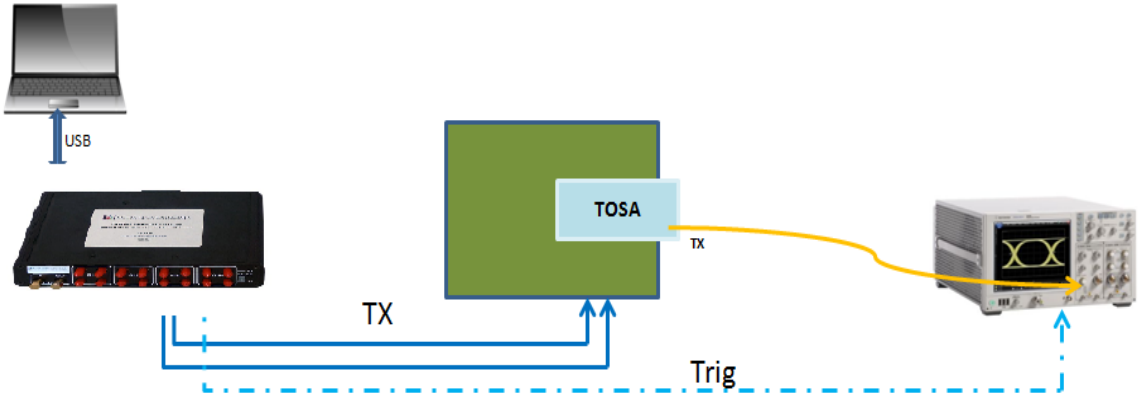
CFP2/CFP4/QSFP14 module Test Diagram



CFP2/CFP4/QSFP14 ROSA Test Diagram



CFP2/CFP4/QSFP14 TOSA Test Diagram



Flexible Reconfiguration

Three sets CA9806 can be integrated into to a 12 X 15 Gbps(180Gbps)

Testing system

Claims and Repackaging

If physical damage is evident or if the instrument does not meet specification when received, notify the carrier and the UC Instruments Corp. Maintenance Service Center. The Maintenance Service Center will arrange for repair or replacement of the unit without waiting for settlement of the claim against the carrier.

Return Shipments to UC Instruments Corporation

If the instrument is to be shipped to a UC Instruments Corp. Maintenance Service Center, attach a tag showing owner, return address, model number and full serial number and the type of service required.

The original shipping carton and packing material may be reusable, but the UC Instruments Corp. Maintenance Service Center will provide information and recommendation on materials to be used if the original packing is no longer available or reusable.

General instructions for repackaging are as follows:

- Wrap instrument in heavy paper or plastic.
- Use strong shipping container.
- Use enough shock absorbing material around all sides of the instrument to provide a firm cushion and prevent movement inside container. Protect control panel with cardboard.
- Seal shipping container securely.
- Mark shipping container **FRAGILE** to encourage careful handling.

- In any correspondence, refer to instrument by model number and serial number.

Maintenance

- Avoid sharp vibration when operation.
- Keep the head face of sensor clean.
- Cover the channel adaptor on the front panel with the dust cap.
- Don’t forcibly push or drag the connector out of the adaptor of CA9806.
- Be careful for crash and fall-off.

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